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OF THE
UNIVERSITY OF WISCONSIN.

VOL. X. PART 1.

OBSERVATIONS OF DOUBLE STARS.

BY GEORGE C. COMSTOCK,
DIRECTOR.

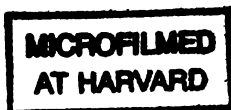
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1896.

The Washburn Observatory,

FOUNDED BY

Cadwallader C. Washburn.

Born 1818; Died 1882.



INTRODUCTION.

THE following pages contain observations of double stars made with the 40*cm* (Clark) equatorial telescope of the Washburn Observatory between the years 1892 and 1896. The stars observed are for the most part well known binary systems in rapid motion, but a certain number of other stars have been added to the list from time to time, among which are eleven stars of very slow relative motion taken from the list of circum-polar stars selected by Otto Struve for observation by different astronomers as comparison stars.

The instrument is described and the methods of observation employed are set forth in Vol. VI of the Publications of the Washburn Observatory to which reference may be made for details. No substantial change has been made in the instrument or its accessories since the date of that volume save that electric lights have been introduced into the dome and are now employed for its general illumination.

From the investigation contained in Vol. VI I adopt as the mean value of a revolution of the micrometer screw, 10'.446. The temperature coefficient and the periodic errors of the screw are quite insensible and its progressive error, although large, has no appreciable effect upon double star distances.

The position of the polar axis of the instrument during the present series of observations is shown by the following observed values of ξ and η (Struve).

| Date. | ξ | η |
|---------------|-------|--------|
| 1892 June 24 | -0'.8 | -0'.9 |
| 1893 Nov. 20 | -0'.6 | -1'.1 |
| 1895 Sept. 12 | -0'.5 | -1'.5 |
| 1896 Aug. 4 | -1'.1 | -1'.5 |

The small progressive variation of the coordinates heretofore noted appears still to continue, but the magnitude of the quantities involved is so small that their effect upon the measurements of double stars has been neglected. The effect of refraction upon the observations has also been neglected in all cases.

The several oculars employed for measurements of double stars are as follows:

| Ocular. | Field. | Power. | Design. | Maker. |
|---------|--------|--------|-----------|--------|
| I | 11.6 | 196 | Ramsden | Clark |
| II | 8.6 | 284 | " | " |
| III | 5.6 | 439 | " | " |
| IV | 3.6 | 792 | " | " |
| V | 7.7 | 325 | Steinheil | Kahler |
| VI | 5.1 | 537 | " | " |
| VII | 3.4 | 716 | " | " |
| VIII | 2.9 | 850 | " | " |
| IX | 0.8 | 1540 | " | " |

The methods of observing set forth in Vol. VI have in general been adopted for the present work but with the following modifications:

(a) The observations for the most part, have been confined to nights on which the "seeing" was sufficiently good to permit the use of high magnifying powers, by far the larger part of the observations having been made with a power of 792 diameters.

(b) I have uniformly held my head in such a position during the observations that the line joining the eyes was either parallel or perpendicular to the line joining the star images.

(c) The measurements of distance between the star images have been made by placing the micrometer threads upon the disks of the stars. In a very few cases the method designated in Vol. VI by the letter *b* has been employed in the observation of very close and difficult stars. I have not employed this method for distances greater than 0'.5 and below that limit there appears to be no systematic difference between the results furnished by method *b* and by the one usually employed.

In consequence of these modifications the precision of the present series of observations is notably superior to that of my earlier work. From a discussion of the observations made between June, 1892, and August, 1895, excluding all cases in which less than three observations of a star were obtained in a given year, I have found the following values, ω and ϵ , of the probable error of a position angle or distance measured upon a single night. The table contains also ω the value of ω expressed in arc of a great circle.

PROBABLE ERROR OF A SINGLE OBSERVATION.

| Limiting Distances | Mean Distance. | ω | ω' | ϵ |
|-----------------------|-------------------|----------|-----------|------------|
| 0.2 to 0.5 | 0.86 | 2.28 | 0.014 | 0.029 |
| 0.5 1.0 | 0.66 | 1.86 | .016 | .046 |
| 1.0 2.0 | 1.37 | 1.10 | .026 | .059 |
| 2.0 4.0 | 2.85 | 0.85 | .043 | .065 |
| 4.0 8.0 | 5.90 | 0.77 | .077 | .087 |

It appears from this table that at all distances to which the observations extend the measurements of direction are more precise than those of distance and that this difference is especially marked in the case of very close and difficult objects, agreeing in this respect with the experience of most other observers. This superior accuracy of the position angles in the present case is the more remarkable from the circumstance that the distances in general depend upon a greater number of settings of the micrometer than do the position angles, the normal number of pointings being from three to five settings of the position circle and either two or three double distances, i. e. four to six pointings, for the distance between the stars.

It may further be noted that the maximum precision of measurement is attained in the case of the closest and most difficult stars for which the observer is often inclined to feel that the observation would be better omitted. In cases of the kind, e. g. when the distance is less than $0''.50$, I have frequently been able to measure a position angle with some degree of satisfaction under atmospheric conditions which precluded all hope of measuring the distance. In such cases I have estimated the

| M. | M.—E. |
|------|-------|
| 0.80 | —0.04 |
| .40 | — .08 |
| .50 | — .08 |
| .60 | — .01 |
| .70 | + .04 |

distance as best I could and in order to establish the relation of these estimated distances to the measured ones I have made it my uniform practice to estimate all measured distances less than $0''.75$; the estimates, of course, preceding the microm-

eter pointings, and care being had that subsequent estimates should not be prejudiced by prior observations. The preceding table shows the relation of the measured to the estimated distance, M.—E., as derived from a graphical adjustment of 200 observations made with Ocular IV.

A discussion of the probable errors furnished by the same data shows that for all distances less than $0''.60$ the probable error of a single estimate of distance may be assumed constant and equal to $\pm 0''.040$. For distances less than half a second, therefore, the estimates and the measurements possess very approximately the same degree of precision. At greater distances the probable error of the estimates increases very rapidly and they are of little value. In the printed observations estimated distances are indicated by the letters *est.* To the printed numbers corrections taken from the above table have been applied and the corrected values included in the annual mean values which follow the observations. I am, however, by no means certain that the corrections thus applied have improved the estimated distances.

The coordinates of the stars which are given in the following pages are referred to the equinox of 1880.0:

The note, VI inch, which appears a few times in the column of Remarks, denotes that the aperture of the telescope was cut down to six inches. I have occasionally found this device of service in improving the definition of the stars, but in general it is of doubtful utility.

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Ocular. | Remarks. |
|-------|---------|----------|----------|---------|----------|
| | h | . | . | | |

 Σ 2.

R. A., 0h 2m.7

Dec., +79° 2'

| | | | | | |
|----------|------|-------|-----------|----|------------|
| 1893.843 | 23.0 | 350.3 | 0.25 est | IV | Cuneiform. |
| 1894.046 | 0.2 | 347.1 | 0.30 est. | IV | Elongated. |

O Σ 4.

R. A., 0h 10m 4

Dec., +85° 50'

| | | | | | |
|----------|------|-------|-----------|----|----------------------------|
| 1893.815 | 1.8 | 297.3 | .... | IV | Elongated. |
| .843 | 23.2 | 310.0 | 0.25 est. | IV | Elongated. Very difficult. |
| 1895.758 | 23.6 | 122.6 | 0.20 est. | IV | Elongated. |

 Σ 19.

R. A., 0h 10m.7

Dec., +85° 58'

| | | | | | |
|----------|------|--------|------|-------|----------------------------|
| 1893.799 | 0.0 | 133.5 | 2.13 | IV | No motion since Σ . |
| 1894.958 | 1.5 | 136.6 | 2.15 | IV | |
| 1895.780 | 23.3 | 133.1 | 2.29 | VI | |
| 1894.846 | 3 n | 134.40 | 2.19 | Mean. | |

 Σ 60, η CASSIOPEAE.

R. A., 0h 41m.6

Dec., +57° 10'

| | | | | | |
|----------|------|-------|------|-----|---------------------------|
| 1892.559 | 19.6 | 191.4 | 4.98 | III | Blazing. |
| .896 | 20.5 | 194.3 | 5.08 | IV | Bad seeing. |
| .923 | 21.8 | 196.6 | 4.75 | III | |
| 1893.843 | 20.5 | 196.0 | 4.88 | IV | |
| 1894.046 | 0.8 | 201.6 | 4.89 | III | Daylight. Good. |
| 1895.151 | 4.0 | 203.7 | 5.03 | III | Daylight. Good. |
| .184 | 6.7 | 203.5 | 4.97 | III | Very bad seeing. VI inch. |
| .180 | 5.2 | 204.1 | 5.03 | III | Very bad seeing. |

OBSERVATIONS OF DOUBLE STARS.

| Date. | Sid. T. | p | s | Ocular. | Remarks. |
|-------|---------|-----|-----|---------|----------|
| | h | ° | ' | | |

 η CASSIOPEAE — Continued.

| | | | | | |
|----------|------|--------|------|--------|-------|
| 1895.824 | 23.2 | 208.4 | 4.70 | I | Good. |
| .832 | 23.2 | 208.1 | 4.84 | I | |
| .840 | 22.6 | 207.7 | 4.92 | III | |
| 1892.769 | 3 n | 194.10 | 4.92 | Means. | |
| 93.945 | 2 n | 198.80 | 4.88 | | |
| 95.174 | 3 n | 208.77 | 5.01 | | |
| 95.882 | 3 n | 208.07 | 4.82 | | |

66 PISCUM, $\alpha \Sigma 20$.

R. A., 0h 48m.2

Dec., +18° 32'

| | | | | | |
|----------|------|--------|-----------|--------|----------------------------------|
| 1893.815 | 2.0 | 339.0 | 0.49 | IV | Not separated. Not separated. |
| .843 | 23.7 | 334.6 | 0.30 est. | IV | |
| 1894.958 | 1.9 | 337.9 | 0.45 | IV | |
| 1895.758 | 23.9 | 333.1 | 0.41 | IV | |
| .854 | 23.2 | 331.2 | 0.35 est. | IV | |
| 1896.036 | 0.7 | 333.6 | 0.40 est. | IV | |
| 1894.205 | 3 n | 337.17 | 0.40 | Means. | |
| 1895.888 | 3 n | 332.63 | 0.37 | | |

 $\Sigma 73$, 36 ANDROMEDAE.

R. A., 0h 48m.5

Dec., +22° 59'

| | | | | | |
|----------|------|------|------|-----|------------------|
| 1892.760 | 0.0 | 7.4 | 1.01 | III | Blurred. |
| .788 | 0.2 | 8.3 | 0.98 | III | |
| .859 | 22.7 | 10.2 | 1.09 | III | |
| 1893.799 | 0.5 | 9.5 | 1.18 | IV | Confused images. |
| .810 | 1.4 | 11.8 | 1.34 | IV | |
| .843 | 23.5 | 9.3 | 0.96 | IV | |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Ocular. | Remarks. |
|-------|---------|----------|----------|---------|----------|
| | h | ° | ' | | |

36 ANDROMEDAE—Continued.

| | | | | | |
|----------|------|-------|------|--------|------------------|
| 1895.758 | 23.8 | 14.2 | 1.08 | IV | Confused images. |
| .780 | 23.7 | 12.9 | 1.29 | IV | |
| .813 | 23.3 | 13.7 | 0.90 | VI | |
| 1892.802 | 3 n | 8.68 | 1.03 | Means. | |
| 93.817 | 3 n | 10.20 | 1.16 | | |
| 95.784 | 3 n | 13.60 | 1.09 | | |

Σ 170.

R. A., 1h 44m.6

+75° 39'

| | | | | | |
|----------|------|--------|------|-------|--------------------|
| 1893.879 | 0.0 | 246.6 | 3.09 | III | No motion since Σ. |
| 1895.695 | 21.8 | 247.6 | 3.20 | III | |
| .758 | 0.4 | 246.1 | 3.13 | III | |
| .769 | 22.0 | 248.0 | 3.32 | III | |
| .791 | 23.5 | 247.0 | 3.31 | IV | |
| .807 | 22.0 | 246.8 | 3.44 | III | |
| 1895.450 | 6 n | 247.02 | 3.25 | Mean. | |

Σ 191.

R. A., 1h 52m.7

Dec., +73° 18'

| | | | | | |
|----------|------|--------|------|-------|---------------|
| 1893.879 | 0.2 | 191.5 | 5.34 | III | Very blurred. |
| 1895.695 | 22.0 | 189.5 | 5.63 | III | |
| .758 | 0.6 | 193.6 | 5.62 | III | |
| .769 | 22.3 | 193.3 | 5.43 | III | |
| .791 | 23.7 | 194.4 | 5.51 | IV | |
| .807 | 22.2 | 188.7 | 5.40 | III | |
| 1895.450 | 6 n | 191.83 | 5.49 | Mean. | |

OBSERVATIONS OF DOUBLE STARS.

| Date. | Sid. T. | p | s | Ocular. | Remarks. |
|-------|---------|------------|-----|---------|----------|
| | h | $^{\circ}$ | $'$ | | |

 Σ 228.

R. A., 2h 6m.4

Dec., +46° 56'

| | | | | | |
|----------|-----|--------|------|-------|------------------------|
| 1895.151 | 6.4 | 248.7 | 0.86 | IV | Separated by glimpses. |
| .758 | 0.2 | 70.8 | 0.52 | IV | Blurred. |
| 1895.454 | 2 n | 249.50 | 0.44 | Mean. | |

 Σ 333, ϵ ARIETIS.

R. A., 2h 52m.5

Dec., +20° 50'

| | | | | | |
|----------|-----|--------|------|-------|----------------------|
| 1893.883 | 1.7 | 197.4 | 1.33 | IV | Images very blurred. |
| 1894.997 | 3.9 | 200.6 | 1.35 | IV | |
| 1894.440 | 2 n | 199.00 | 1.34 | Mean. | |

O Σ 53.

R. A., 3h 9m.9

Dec., +38° 12'

| | | | | | |
|----------|------|--------|------|-------|--|
| 1893.810 | 1.8 | 244.7 | 0.52 | IV | |
| .815 | 0.5 | 244.1 | 0.54 | IV | |
| .843 | 23.9 | 244.0 | 0.53 | IV | |
| 1893.823 | 3 n | 244.27 | 0.53 | Mean. | |

 Σ 412, 7 TAURI, A B.

R. A., 3h 27m.3

Dec., +24° 3'

| | | | | | |
|----------|-----|-------|-------|----|------------------|
| 1893.815 | 0.7 | | | IV | Elongated in 0°. |
|----------|-----|-------|-------|----|------------------|

 Σ 412 $\frac{1}{2}$ (A+B), C.

R. A., 3h 27m.3

Dec., +24° 3'

| | | | | | |
|----------|-----|------|-------|----|--|
| 1893.810 | 2.1 | 59.7 | 23.21 | IV | |
|----------|-----|------|-------|----|--|

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Ocular. | Remarks. |
|-------|----------|----------|----------|---------|----------|
| | <i>h</i> | <i>o</i> | <i>s</i> | | |

 Σ 460, 49 H. CEPHEI.

R. A., 3h 50m.0

Dec., +80° 22'

| | | | | | |
|----------|------------|-------|------|--------|----------|
| 1892.769 | 21.1 | 41.2 | 0.69 | IV | Blurred. |
| .788 | 28.6 | 43.6 | 0.91 | IV | |
| 1893.246 | 11.2 | 40.1 | 0.81 | IV | |
| .250 | 8.5 | 43.3 | 0.88 | IV | |
| .843 | 0.0 | 43.7 | 0.76 | IV | |
| 1894.258 | 10.3 | 42.9 | 0.79 | VIII | |
| 1892.778 | 2 <i>n</i> | 42.40 | 0.80 | Means. | |
| 93.248 | 2 <i>n</i> | 41.70 | 0.82 | | |
| 94.000 | 2 <i>n</i> | 43.30 | 0.78 | | |

 Σ 518, 40 ERIDANI B. C.

R. A., 4h 9m.8

Dec., -7° 48'

| | | | | | |
|----------|-----|------|------|---|--|
| 1893.211 | 6.8 | 93.8 | 2.18 | I | |
|----------|-----|------|------|---|--|

O Σ 82.

R. A., 4h 16m.0

Dec., +14° 46'

| | | | | | |
|----------|-----|-------|------|----|----------|
| 1893.173 | 7.0 | 151.9 | 0.56 | IV | Blurred. |
|----------|-----|-------|------|----|----------|

 β 883.

R. A., 4h 44m.5

Dec., +10° 52'

| | | | | | |
|----------|-----|---------|------------|--------|--|
| 1895.208 | 7.0 | Suspect | elongation | in 0°. | |
|----------|-----|---------|------------|--------|--|

O Σ 89.

R. A., 4h 49m.5

Dec., +73° 53'

| | | | | | |
|----------|------|----------|-------------|------|--|
| 1894.258 | 10.0 | Doubtful | elongation. | | |
|----------|------|----------|-------------|------|--|

OBSERVATIONS OF DOUBLE STARS.

| Date. | Sid. T. | p | s | Ocular. | Remarks. |
|-------|---------|-----|-----|---------|----------|
| | h | ° | ' | | |

O Σ 98, 14 ORIONIS.

R. A., 5h 1m.4

+8° 20'

| | | | | | |
|----------|-----|--------|------|--------|---|
| 1893.173 | 7.3 | 187.4 | 1.04 | IV | Blazing. |
| 1894.277 | 8.4 | 190.3 | 0.77 | IV | Badly blurred. |
| 1895.151 | 7.0 | 183.6 | 0.81 | IV | |
| .208 | 6.9 | 185.1 | 0.87 | IV | |
| .282 | 8.6 | 187.0 | .... | IV | Images too diffuse for measurement of distance. |
| 1896.258 | 8.2 | 184.5 | 0.85 | IV | |
| .263 | 8.2 | 186.0 | 0.78 | IV | Very blurred. |
| .271 | 8.6 | 185.2 | 0.71 | IV | Very blurred. |
| 1893.725 | 2 n | 188.85 | 0.90 | Means. | |
| 95.214 | 3-2 | 185.23 | 0.84 | | |
| 96.264 | 3 n | 185.23 | 0.78 | | |

O Σ 124.

R. A., 5h 52m.1

Dec., +12° 48'

| | | | | | |
|----------|-----|------|------|----|---------------------------|
| 1894.258 | 8.2 | .... | .... | IX | Single. |
| .263 | 8.0 | .... | .... | IV | Cannot separate. Blurred. |
| 1895.208 | 7.1 | .... | .... | IV | Single. |
| 1896.225 | 8.1 | .... | .... | IV | Single. |
| .258 | 8.3 | .... | .... | IV | Single. |

O Σ 149.

R. A., 6h 29m.0

Dec., +27° 23'

| | | | | | |
|----------|-----|-------|------|----|-------|
| 1894.239 | 7.4 | 282.5 | 0.56 | IV | Fair. |
| .246 | 7.8 | 287.5 | 0.58 | IV | Good. |
| .258 | 8.5 | 285.3 | 0.54 | IV | |
| 1895.208 | 7.5 | 280.4 | 0.52 | IV | |

| Date. | Sid. T. | p | s | Ocular. | Remarks. |
|-------|---------|-----|-----|---------|----------|
| | h | ° | ' | | |

O Σ 149 — Continued.

| | | | | | |
|----------|-----|--------|------|--------|-------|
| 1896.225 | 8.0 | 282.8 | 0.63 | IV | Good. |
| .244 | 7.8 | 280.7 | 0.61 | IV | |
| .258 | 8.5 | 281.8 | 0.59 | IV | |
| .263 | 8.4 | 283.2 | 0.58 | IV | |
| 1894.248 | 3 n | 285.10 | 0.56 | Means. | |
| 95.208 | 1 n | 280.40 | 0.52 | | |
| 96.245 | 4 n | 282.12 | 0.60 | | |

 Σ 1110, CASTOR.

R. A., 7h 27m.0

Dec., +32° 8'

| | | | | | |
|----------|------|--------|------|--------|---------------------------------|
| 1892.497 | 13.2 | 230.2 | 5.62 | III | Daylight obs. Good. |
| 1893.208 | 4.8 | 228.3 | 5.58 | IV | |
| 1894.288 | 6.3 | 226.9 | 5.62 | III | Daylight. Blazing and unsteady. |
| .307 | 7.0 | 229.1 | 5.69 | III | Daylight. Blazing. |
| 1895.280 | 8.6 | 226.9 | 5.62 | III | Daylight. Fair. |
| .282 | 8.9 | 227.4 | 5.66 | IV | Very blurred. |
| .312 | 7.2 | 229.4 | 5.64 | III | Daylight. Unsteady. |
| 1896.263 | 8.6 | 227.1 | 5.69 | IV | |
| .271 | 8.8 | 227.4 | 5.50 | IV | |
| .406 | 12.2 | 228.1 | 5.49 | III | |
| 1892.848 | 2 n | 229.25 | 5.60 | Means. | |
| 94.298 | 2 n | 228.00 | 5.66 | | |
| 95.291 | 3 n | 227.90 | 5.64 | | |
| 96.313 | 3 n | 227.58 | 5.56 | | |

OBSERVATIONS OF DOUBLE STARS.

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Ocular. | Remarks. |
|-------|----------|----------|----------|---------|----------|
| | <i>h</i> | <i>o</i> | <i>r</i> | | |

 β 101, 9 ARGUS.

R. A., 7h 46m.2

Dec., -13° 35'

| | | | | | |
|----------|------------|--------|------------------|--------|------------------------|
| 1894.230 | 7.6 | 292.5 | 0.45 <i>est.</i> | IV | Blurred. |
| .246 | 8.0 | 284.8 | 0.35 | IV | Blurred but separated. |
| .258 | 8.0 | 282.6 | 0.29 | IX | The quadrant is right. |
| 1895.208 | 7.7 | 284.5 | 0.45 | IV | |
| .217 | 7.6 | 285.9 | 0.39 | IV | |
| 1896.225 | 8.3 | 290.0 | 0.52 | IV | |
| .244 | 7.9 | 288.9 | 0.44 | IV | Blurred. |
| .258 | 8.7 | 287.1 | 0.52 | IV | Good |
| 1894.245 | 8 <i>n</i> | 286.62 | 0.35 | Means. | |
| 95.212 | 2 <i>n</i> | 285.20 | 0.42 | | |
| 96.242 | 3 <i>n</i> | 287.00 | 0.49 | | |

 β 581. A. B.

R. A., 7h 57m.7

Dec., +12° 38'

| | | | | | |
|----------|------------|--------|------|--------|-------|
| 1895.217 | 7.9 | 268.7 | 0.39 | IV | Good. |
| .318 | 10.4 | 271.2 | 0.36 | IV | |
| .320 | 10.3 | 275.8 | 0.27 | IV | |
| 1896.225 | 8.5 | 273.1 | 0.35 | IV | |
| .244 | 8.2 | 272.8 | 0.38 | IV | |
| .258 | 8.8 | 272.9 | 0.39 | IV | Good. |
| 1895.285 | 8 <i>n</i> | 271.90 | 0.34 | Means. | |
| 96.242 | 8 <i>n</i> | 272.93 | 0.37 | | |

 β 581. A. C.

| | | | | | |
|----------|------|-------|------|---|---------------------|
| 1895.217 | 8.1 | 190.1 | 4.73 | V | |
| .318 | 10.6 | 191.1 | 4.32 | I |13m. Difficult. |

| Date. | Sid. T. | p | s | Ocular. | Remarks. |
|-------|---------|-----|-----|---------|----------|
| | h | . | . | | |

 β 581. A. C. — Continued.

| | | | | | |
|----------|------|--------|------|--------|-------------------------|
| 1895.320 | 10.4 | 193.4 | 4.80 | I |12.5. Difficult. |
| 1896.225 | 8.7 | 193.5 | 4.62 | V | $\frac{1}{2}$ (A+B), C. |
| .244 | 8.3 | 192.3 | 4.59 | V | " " |
| .258 | 8.9 | 192.0 | 4.53 | V | " " |
| 1895.285 | 3 n | 191.53 | 4.45 | Means. | |
| 96.242 | 3 n | 192.60 | 4.58 | | |

 Σ 1196. ζ CANCEL. A. B.

R. A., 8h 5m.3

Dec., +10° 0'

| | | | | | |
|----------|-----|-------|------|--------|-------------------------|
| 1893.162 | 8.8 | 26.0 | 0.84 | IV | Seeing fair. |
| .246 | 9.4 | 28.5 | 1.12 | IV | Blazing. |
| 1894.222 | 9.2 | 22.6 | 0.79 | IV | Seeing fair. |
| .230 | 7.8 | 23.1 | 0.92 | IV | |
| .239 | 7.9 | 22.9 | 1.07 | IV | |
| 1895.203 | 7.2 | 20.7 | 0.89 | IV | |
| .206 | 8.6 | 21.8 | 1.10 | IV | |
| .271 | 9.0 | 20.3 | 1.04 | IV | |
| 1896.225 | 9.5 | 18.1 | 1.04 | IV | |
| .244 | 8.4 | 16.8 | 1.12 | IV | |
| .255 | 8.5 | 18.9 | 0.90 | IV | Wind shaking telescope. |
| .258 | 9.1 | 17.1 | 1.20 | IV | Good. |
| 1893.204 | 2 n | 27.25 | 0.98 | Means. | |
| 94.230 | 3 n | 22.87 | 0.93 | | |
| 95.227 | 3 n | 20.93 | 1.01 | | |
| 96.246 | 4 n | 17.72 | 1.06 | | |

| Date. | Sid T. | <i>p</i> | <i>s</i> | Ocular. | Remarks. |
|-------|--------|----------|----------|---------|----------|
| | h | ° | ' | | |

Σ 1196. ζ CANCRI. A. C.

| | | | | | |
|----------|-----|--------|------|-------|------------------------|
| 1893.246 | 9.6 | 115.7 | 5.45 | IV | Blazing. |
| 1894.222 | 9.4 | 116.2 | 5.22 | IV | Seeing fair. |
| .230 | 8.0 | 115.4 | 5.40 | IV | |
| .239 | 8.1 | 115.9 | 5.34 | IV | |
| 1895.203 | 7.4 | 117.1 | 5.19 | IV | |
| .206 | 8.7 | 116.5 | 5.24 | IV | |
| .271 | 9.1 | 116.1 | 5.30 | IV | |
| 1896.225 | 9.6 | 118.3 | 5.28 | IV | |
| .244 | 8.6 | 115.7 | 5.34 | IV | |
| .255 | 8.7 | 116.3 | 5.24 | IV | Wind shaking telescope |
| .258 | 9.2 | 115.5 | 5.31 | IV | |
| 1893.246 | 1 n | 115.70 | 5.45 | Means | |
| 94.230 | 3 n | 115.83 | 5.32 | | |
| 95.227 | 3 n | 116.57 | 5.24 | | |
| 96.246 | 4 n | 116.45 | 5.28 | | |

Σ 1216.

R. A., 8h 14m.8

Dec., -1° 11'

| | | | | | |
|----------|-----|-------|------------------|----|---|
| 1894.230 | 8.2 | 178.8 | 0.40 <i>est.</i> | IV | Blurred, not separated. |
| .230 | 8.8 | 180.4 | 0.45 <i>est.</i> | IV | Inadvertently observed twice on same night. |
| .239 | 8.8 | 186.8 | 0.35 <i>est.</i> | IV | |
| .246 | 8.2 | 181.6 | 0.42 | IV | Separated. |
| 1895.208 | 8.0 | 183.3 | 0.30 <i>est.</i> | IV | Not separated. |
| .208 | 8.0 | 183.2 | 0.42 | IV | Separated. |
| .217 | 8.8 | 185.2 | 0.38 | IV | |
| 1896.244 | 8.9 | 191.5 | 0.40 <i>est.</i> | IV | Blurred. Not separated. |

| Date. | Sid T. | <i>p</i> | <i>s</i> | Ocular. | Remarks. |
|-------|----------|----------|----------|---------|----------|
| | <i>h</i> | . | . | | |

Σ 1216—Continued.

| | | | | | |
|----------|------------|--------|------|--------|--|
| 1894.236 | 4 <i>n</i> | 181.90 | 0.39 | Means. | |
| 95.209 | 3 <i>n</i> | 183.90 | 0.36 | | |
| 96.244 | 1 <i>n</i> | 191.50 | 0.37 | | |

β 208.

R. A., 8h 33m.9

Dec., -22° 16'

| | | | | | |
|----------|------|-----------|------------------|--------|-------------------------|
| 1894.246 | .... | Suspect | elongation | in 35° | |
| .258 | 8.7 | 47.6 | 0.57 | IV | Seen well by glimpses. |
| 1895.203 | 7.8 | Cannot | separate. | IV | Bad definition. |
| .320 | 10.1 | 55.5 | 0.60 <i>est.</i> | VIII | Blurred. Not separated. |
| 1896.225 | 9.1 | Cannot | measure. | ... | |
| .244 | 8.7 | Cannot | measure. | .... |  |
| .258 | 9.3 | Elongated | in 65° | .... | Blurred |

ε HYDRAB, A. B.

R. A., 8h 40m.4

Dec., +6° 52'

| | | | | | |
|----------|------------|-------------|------------------|--------|--------------------------------|
| 1894.246 | .... | Very slight | elongation | in 0°. | |
| .258 | 9.2 | 192.8 | 0.20 <i>est.</i> | IX | |
| .277 | 9.3 | 184.7 | 0.20 <i>est.</i> | IV | Slight but certain elongation. |
| .312 | 9.3 | 200.9 | 0.20 <i>est.</i> | IV | |
| 1895.320 | 10.0 | 215.0 | 0.15 <i>est.</i> | IX | Elongated. |
| .326 | 10.5 | 220.0 | 0.20 <i>est.</i> | IV | Certainly elongated. |
| 1896.258 | 9.5 | 226.0 | 0.15 <i>est.</i> | IV | Elongated. |
| 1894.282 | 8 <i>n</i> | 192.80 | 0.16 | Means. | |
| 95.323 | 2 <i>n</i> | 217.50 | 0.14 | | |
| 96.258 | 1 <i>n</i> | 226.00 | 0.12 | | |

3—OB.

OBSERVATIONS OF DOUBLE STARS.

| Date. | Sid. T. | p | s | Ocular. | Remarks. |
|-------|---------|------------|-----|---------|----------|
| | h | $^{\circ}$ | $'$ | | |

 Σ 1273, ϵ HYDRAE, $\frac{1}{2}$ (A+B), C.

R. A., 8h 40m.4

Dec., $+6^{\circ} 52'$

| | | | | | |
|----------|-----|--------|------|-------|--|
| 1894.277 | 9.4 | 229.7 | 3.83 | IV | |
| .312 | 9.4 | 230.0 | 3.88 | IV | |
| 1894.204 | 2 n | 229.85 | 3.86 | Mean. | |

 Σ 3121.

R. A., 9h 10m.7

Dec., $+29^{\circ} 7'$

| | | | | | |
|----------|------|-------|------|--------|-----------------|
| 1893.246 | 10.2 | 5.9 | 0.44 | IV | |
| 1894.230 | 8.6 | 2.0 | 0.50 | IV | Well separated. |
| .246 | 8.6 | 186.8 | 0.45 | IV | Good. |
| .263 | 8.2 | 4.0 | 0.40 | IV | |
| 1895.203 | 7.8 | 4.1 | 0.53 | IV | |
| .252 | 10.8 | 10.5 | 0.55 | IV | Good. |
| .318 | 9.9 | 191.9 | 0.43 | IV | |
| 1896.225 | 9.8 | 13.0 | 0.57 | IV | |
| .244 | 9.1 | 7.0 | 0.63 | IV | |
| .258 | 9.7 | 192.4 | 0.61 | IV | |
| 1893.246 | 1 n | 5.90 | 0.44 | Means. | |
| 94.246 | 3 n | 4.27 | 0.45 | | |
| 95.258 | 3 n | 8.83 | 0.50 | | |
| 96.242 | 3 n | 10.80 | 0.60 | | |

 Σ 1338.

R. A., 9h 13m 2

Dec., $+38^{\circ} 43'$

| | | | | | |
|----------|------|-------|------|----|-------------------|
| 1894.312 | 9.8 | 163.3 | 1.57 | IV | Excellent seeing. |
| .348 | 10.6 | 166.2 | 1.52 | IV | Good. |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Ocular. | Remarks. |
|-------|----------|----------|----------|---------|----------|
| | <i>h</i> | <i>o</i> | <i>'</i> | | |

Σ 1338 — Continued.

| | | | | | |
|----------|------------|--------|------|--------|------------------------------|
| 1895.296 | 10.9 | 162.4 | 1.54 | IV | Fine definition. |
| .318 | 12.6 | 161.9 | 1.55 | III | Blurred; unsatisfactory obs. |
| .378 | 11.6 | 161.9 | 1.48 | IV | Blurred. |
| 1894.330 | 2 <i>n</i> | 164.75 | 1.54 | Means. | |
| 95.331 | 3 <i>n</i> | 162.07 | 1.52 | | |

Σ 1356, ω LEONIS.

R A., 9h 22m.0

Dec., +9° 35'

| | | | | | |
|----------|------------|--------|-------|--------|-----------------------------|
| 1898.246 | 9.9 | 101.5 | 0.61 | IV | Blurred. |
| 1894.222 | 9.8 | 107.1 | 0.6 ± | IV | Blurred; distance very poor |
| .230 | 8.4 | 107.5 | 0.66 | IV | Blurred. |
| .239 | 8.7 | 105.0 | 0.74 | IV | Blurred. |
| 1895.208 | 8.3 | 105.9 | 0.78 | IV | |
| .252 | 11.0 | 107.8 | 0.65 | IV | Good. |
| .271 | 9.5 | 104.6 | 0.57 | IV | Thro' clouds. Very faint. |
| 1896.255 | 9.0 | 107.8 | 0.70 | IV | |
| .258 | 9.8 | 106.3 | 0.76 | IV | |
| .263 | 8.9 | 107.6 | 0.67 | IV | |
| .367 | 9.7 | 107.3 | 0.63 | IV | Good. |
| 1898.246 | 1 <i>n</i> | 101.50 | 0.61 | Means. | |
| 94.230 | 3—2 | 106.53 | 0.70 | | |
| 95.242 | 3 <i>n</i> | 106.10 | 0.67 | | |
| 96.286 | 4 <i>n</i> | 107.25 | 0.69 | | |

OBSERVATIONS OF DOUBLE STARS.

| Date | Sid. T. | <i>p</i> | <i>s</i> | Ocular. | Remarks. |
|------|---------|----------|----------|---------|----------|
| | h | . | ' | | |

O. Σ . 208. ϕ URSAE MAJORIS.

R. A., 9h 48m.8

Dec., +54° 38'

| | | | | | |
|----------|------|------|------|------|---------|
| 1892.578 | 16.0 | .... | .... | ... | Single. |
| 1894.246 | 9.0 | .... | .... | .... | Round. |

8 SEXTANTIS.

R. A., 9h 46m.6

Dec., -7° 32'

| | | | | | |
|----------|------------|--------|------------------|--------|---|
| 1894.239 | 9.2 | 99.6 | 0.30 <i>est.</i> | IV | Separated by glimpses. |
| .246 | 9.8 | 102.7 | 0.35 <i>est.</i> | IV | Separated by glimpses. |
| .258 | 9.4 | 104.4 | 0.30 | IX | Blurred but separated. |
| 1895.296 | 11.8 | 99.1 | 0.37 | IV | |
| .318 | 10.2 | 98.0 | 0.43 | IV | Distance is too great. Stars are just separated. |
| .320 | 10.7 | 98.8 | 0.38 | IV | |
| 1896.255 | 9.2 | 97.1 | 0.34 | IV | Separated by glimpses. |
| .258 | 10.0 | 95.2 | 0.40 | IV | |
| 1894.248 | 3 <i>n</i> | 102.23 | 0.29 | Means. | |
| 95.311 | 3 <i>n</i> | 98.63 | 0.39 | | |
| 96.256 | 2 <i>n</i> | 96.15 | 0.37 | | |

O Σ 215.

R. A., 10h 9m.7

Dec., +18° 20'

| | | | | | |
|----------|------------|--------|------|--------|---------------------|
| 1892.471 | 14.6 | 215.9 | 0.62 | IV | Rather poor seeing. |
| .487 | 14.5 | 214.0 | 0.72 | IV | Poor seeing. |
| 1893.246 | 10.5 | 209.2 | 0.73 | IV | |
| 1894.195 | 8.7 | 210.8 | 0.64 | IV | Poor seeing. |
| 1892.479 | 2 <i>n</i> | 214.95 | 0.67 | Means. | |
| 93.720 | 2 <i>n</i> | 210.00 | 0.68 | | |

| Date. | Sid. T. | p | s | Ocular. | Remarks. |
|-------|---------|-----|-----|---------|----------|
| | h | . | ' | | |

 Σ 1424, γ LEONIS.

R. A., 10h 13m.3

Dec., +20° 27'

| | | | | | |
|----------|------|--------|------|--------|-----------------------------|
| 1892.444 | 18.2 | 115.9 | 3.37 | III | |
| .468 | 18.0 | 114.5 | 3.46 | IV | Good. |
| .471 | 12.9 | 113.8 | 3.48 | IV | Good. |
| .487 | 13.4 | 114.1 | 3.41 | IV | |
| 1894.288 | 6.7 | 115.1 | 3.22 | III | Unsteady and faint. Clouds. |
| .307 | 7.3 | 115.1 | 3.40 | III | Fairly good. |
| .370 | 8.0 | 114.3 | 3.36 | III | Thro' clouds. Pretty good. |
| 1895.296 | 9.5 | 118.4 | 3.52 | IV | Fair. |
| .326 | 10.2 | 114.9 | 3.70 | IV | Blazing. |
| .378 | 11.4 | 114.1 | 3.62 | III | |
| 1896.255 | 9.9 | 113.4 | 3.62 | IV | |
| .263 | 9.2 | 116.4 | 3.52 | IV | |
| .271 | 9.1 | 116.4 | 3.60 | IV | |
| 1892.468 | 4 n | 114.58 | 3.43 | Means. | |
| 94.322 | 3 n | 114.83 | 3.33 | | |
| 95.333 | 3 n | 115.80 | 3.61 | | |
| 96.263 | 3 n | 115.40 | 3.58 | | |

 $O \Sigma$ 224.

R. A., 10h 33m.4

Dec., +9° 28'

| | | | | | |
|----------|------|-------|------|------|-----------------|
| 1895.230 | 10.2 | 316.5 | 0.46 | IV | Well separated. |
| .246 | 10.0 | 313.3 | 0.45 | IV | |
| .258 | 11.1 | 308.4 | 0.37 | VIII | |
| 1895.203 | 10.3 | 309.0 | 0.46 | IV | |
| .296 | 9.7 | 314.9 | 0.43 | IV | |
| .309 | 11.7 | 307.2 | 0.39 | IV | Well separated. |
| 1896.258 | 10.2 | 308.4 | 0.37 | IV | |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Ocular. | Remarks. |
|-------|----------|----------|----------|---------|----------|
| | <i>h</i> | <i>o</i> | <i>r</i> | | |

O Σ 224 — Continued.

| | | | | | |
|----------|------------|--------|------|--------|--|
| 1894.245 | 3 <i>n</i> | 312.73 | 0.43 | Means. | |
| 95.269 | 3 <i>n</i> | 310.37 | 0.43 | | |
| 96.258 | 1 <i>n</i> | 308.40 | 0.37 | | |

O Σ 227.

R. A., 10h 35m.3

Dec., +11° 22'

| | | | | | |
|----------|------------|--------|------------------|--------|-------------------------|
| 1894.246 | 10.2 | 346.6 | 0.42 | IV | Blurred and indistinct. |
| .258 | 11.3 | 347.9 | 0.49 | VIII | |
| .263 | 9.0 | 334.1 | 0.50 <i>est.</i> | IV | |
| 1895.203 | 10.6 | 347.1 | 0.47 | IV | |
| .296 | 10.0 | 346.9 | 0.55 | IV | |
| .309 | 11.6 | 347.7 | 0.58 | IV | |
| 1894.256 | 3 <i>n</i> | 342.87 | 0.46 | Means. | |
| 95.269 | 3 <i>n</i> | 347.23 | 0.53 | | |

O Σ 229.

R. A., 10h 41m.1

Dec., +41° 44'

| | | | | | |
|----------|------------|--------|------|--------|-------|
| 1894.230 | 9.7 | 323.6 | 0.75 | IV | Good. |
| .239 | 9.1 | 223.6 | 0.63 | IV | |
| .246 | 9.1 | 323.2 | 0.75 | IV | |
| 1895.203 | 8.5 | 324.7 | 0.69 | IV | |
| .280 | 9.5 | 324.9 | 0.59 | IV | |
| .296 | 12.3 | 324.0 | 0.71 | IV | Good. |
| 1894.238 | 3 <i>n</i> | 323.47 | 0.71 | Means. | |
| 95.260 | 3 <i>n</i> | 324.53 | 0.66 | | |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Ocular. | Remarks. |
|-------|----------|----------|----------|---------|----------|
| | <i>h</i> | <i>o</i> | <i>s</i> | | |

 Σ 1500.

R. A., 10h 53m.7

Dec., $-2^{\circ} 48'$

| | | | | | |
|----------|------------|--------|------|--------|--|
| 1894.230 | 10.8 | 313.7 | 1.57 | IV | |
| .258 | 11.5 | 314.6 | 1.49 | VIII | |
| .263 | 10.9 | 313.8 | 1.27 | III | |
| 1895.296 | 11.1 | 315.2 | 1.58 | IV | |
| .309 | 12.0 | 312.0 | 1.48 | IV | |
| 1894.250 | 3 <i>n</i> | 314.03 | 1.44 | Means. | |
| 95.302 | 2 <i>n</i> | 313.60 | 1.53 | | |

 β 1077. α URSAE MAJORIS.

R. A., 10h 56m.8

 $+62^{\circ} 24'$

| | | | | | |
|----------|------------|--------|-----------------|--------|-----------------------------|
| 1895.203 | 9.1 | 307.6 | 0.7 <i>est.</i> | IV | |
| .296 | 10.2 | 303.4 | 0.85 | IV | Thro' light haze. Good. |
| 1896.263 | 9.8 | 300.7 | 0.79 | IV | Difficult but satisfactory. |
| .334 | 10.7 | 302.1 | 0.89 | IV | Difficult. |
| 1895.250 | 2 <i>n</i> | 305.50 | 0.85 | Means. | |
| 96.298 | 2 <i>n</i> | 301.40 | 0.84 | | |

 Σ 1517.

R. A., 11h 6m.8

Dec., $+20^{\circ} 48'$

| | | | | | |
|----------|------|-------|------|----|--|
| 1894.230 | 10.5 | 98.1 | 0.43 | IV | Space between stars equals semi-diameter of disks. |
| .246 | 10.5 | 276.9 | 0.56 | IV | |
| .277 | 8.8 | 279.1 | 0.44 | IV | Good. |
| 1895.296 | 11.6 | 95.5 | 0.39 | IV | |
| .320 | 11.1 | 275.0 | 0.38 | IV | |
| .378 | 11.8 | 276.1 | 0.34 | IV | Well separated. |
| 1896.258 | 11.4 | 273.0 | 0.40 | IV | |

| Date. | Sid. T. | p | s | Ocular. | Remarks. |
|-------|---------|-----|-----|---------|----------|
| | h | o | . | | |

Σ 1517 — Continued.

| | | | | | |
|----------|------------|--------|------|--------|--|
| 1894.251 | 3 <i>n</i> | 278.03 | 0.48 | Means. | |
| 95.881 | 3 <i>n</i> | 275.53 | 0.37 | | |
| 96.258 | 1 <i>n</i> | 272.00 | 0.40 | | |

Σ 1523, ξ URSAE MAJORIS.

R. A., 11h 11m.8

Dec., +32° 13'

| | | | | | |
|----------|------------|--------|-------|--------|-----------------------|
| 1892.444 | 13.7 | 198.9 | 1.84: | III | |
| .468 | 13.2 | 198.4 | 1.48 | IV | Good. |
| .471 | 13.2 | 198.6 | 1.47 | IV | Good. |
| .487 | 13.7 | 194.2 | 1.50 | IV | Good. |
| 1894.195 | 9.1 | 184.1 | 1.91 | IV | Very blurred. |
| .230 | 10.0 | 182.2 | 1.74 | IV | Good. |
| .239 | 9.7 | 183.3 | 1.72 | IV | Blazing and unsteady. |
| 1895.280 | 9.3 | 176.7 | 1.91 | IV | Blurred. |
| .296 | 11.7 | 176.1 | 1.91 | IV | Good. |
| .320 | 11.3 | 176.6 | 1.98 | IV | Fairly good seeing. |
| 1896.255 | 10.1 | 171.6 | 1.94 | IV | |
| .258 | 11.2 | 171.3 | 1.98 | IV | Very blurred. |
| .271 | 9.3 | 170.9 | 1.89 | IV | |
| .285 | 8.8 | 170.8 | 1.86 | IV | Blurred. |
| 1892.468 | 4 <i>n</i> | 197.52 | 1.57 | Means. | |
| 94.221 | 3 <i>n</i> | 183.20 | 1.79 | | |
| 95.299 | 3 <i>n</i> | 176.47 | 1.93 | | |
| 96.267 | 4 <i>n</i> | 171.15 | 1.92 | | |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Ocular. | Remarks. |
|-------|----------|----------|----------|---------|----------|
| | <i>h</i> | <i>o</i> | <i>o</i> | | |

O Σ 234.

R. A., 11h 24m.4

Dec., +41° 57'

| | | | | | |
|----------|------|---|-----------|-------|--------------------------------|
| 1892.578 | 16.8 | ..... | ..... | IX | Single. |
| 1893.246 | 10.6 | ..... | ..... | IV | Elongated in $p = 125^\circ$. |
| 1894.230 | 10.2 | ..... | ..... | IV | Cannot separate. |
| .239 | 9.5 | Suspect comes in 90° but can not be sure | | | of it. |
| .246 | 9.3 | ..... | ..... | IV | Single. |
| .277 | 9.0 | 123.4 | 0.25 est. | IV | Wedge shaped. |
| .312 | 10.1 | 123.1 | 0.20 est. | IV | Wedge. |
| 1895.203 | 9.3 | 122.2 | 0.30 est. | IV | Elongated. |
| 1894.597 | 3 n | 122.90 | 0.21 | Mean. | |

O Σ 235.

R. A., 11h 25m.5

Dec., +61° 45'

| | | | | | |
|----------|------|-------|-------|------|---------------|
| 1892.487 | 14.3 | 86.4 | 0.91 | IV | Bad seeing. |
| .558 | 15.8 | 80.4 | 0.98 | IV | Good seeing. |
| .578 | 16.2 | 85.8 | 0.81: | IV | |
| 1893.373 | 13.6 | 90.2 | 0.92 | IV | Fair seeing. |
| 1894.230 | 11.2 | 88.8 | 0.78 | IV | |
| .246 | 9.4 | 92.3 | 0.81 | IV | Blurred. |
| .258 | 10.8 | 89.2 | 0.67 | VIII | Fine seeing. |
| 1895.203 | 9.6 | 91.3 | 0.85 | IV | |
| .296 | 10.4 | 97.8 | 0.73 | IV | |
| .318 | 11.9 | 92.5 | 0.80 | IV | |
| 1896.263 | 9.6 | 97.2 | 0.71 | IV | |
| .271 | 9.6 | 98.1 | 0.73 | IV | |
| .307 | 10.8 | 100.3 | 0.65 | IV | Very blurred. |
| .334 | 10.5 | 95.5 | 0.69 | IV | Good. |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Ocular. | Remarks. |
|-------|----------|----------|----------|---------|----------|
| | <i>h</i> | <i>o</i> | <i>s</i> | | |

O Σ 235 — Continued.

| | | | | | |
|----------|------------|-------|------|--------|--|
| 1892.539 | 8 <i>n</i> | 84.20 | 0.90 | Means. | |
| 93.873 | 1 <i>n</i> | 90.20 | 0.92 | | |
| 94.245 | 3 <i>n</i> | 90.10 | 0.75 | | |
| 95.272 | 3 <i>n</i> | 93.87 | 0.79 | | |
| 96.294 | 4 <i>n</i> | 97.78 | 0.70 | | |

 β 456.

R. A., 11h 30m.7

Dec., -11° 41'

| | | | | | |
|----------|------------|-----------------------------|------------------|-------|------------|
| 1894.277 | 11.5 | 278.7 | 0.81 | IV | |
| 1895.296 | 12.0 | Single. | .... | IV | |
| .309 | 12.2 | Suspect elongation in 270°. | .... |  |  |
| .320 | 11.5 | 269.7 | 0.25 <i>est.</i> | IV | Elongated. |
| 1894.798 | 2 <i>n</i> | 274 20 | 0.26 | Mean. | |

 β 794.

R. A., 11h 47m.2

Dec., +74° 26'

| | | | | | |
|----------|------|-------|------------------|------|------------------------|
| 1892.553 | 16.0 | 139.2 | 0.35 <i>est.</i> | IV | Separated by glimpses. |
| .578 | 16.6 | 138.7 | 0.26 | IV | Separation doubtful. |
| 1893.534 | 16.0 | 137.4 | .... | IV | Elongated. Blurred. |
| 1894.230 | 11.4 | 140.2 | 0.39 | IV | Well separated. |
| .246 | 9.7 | 145.5 | 0.44 | IV | |
| .258 | 10.6 | 140.5 | 0.36 | VIII | Well separated. |
| 1895.203 | 9.8 | 141.6 | 0.35 <i>est.</i> | IV | Separated by glimpses. |
| .296 | 10.6 | 150.5 | 0.40 <i>est.</i> | IV | Blurred. |

| Date. | Sid. T. | p | s | Ocular. | Remarks. |
|-------|---------|-----|-----|---------|----------|
| | h | . | . | | |

 β 794 — Continued.

| | | | | | |
|----------|------------|--------|------------------|--------|------------|
| 1896.263 | 10.0 | 153.2 | 0.40 <i>est.</i> | IV | Separated. |
| .334 | 10.9 | 154.1 | 0.50 | IV | |
| 1892.566 | 2 <i>n</i> | 138.95 | 0.28 | Means. | |
| 93.534 | 1 <i>n</i> | 137.40 | .... |  |  |
| 94.245 | 3 <i>n</i> | 145.07 | 0.40 | | |
| 95.250 | 2 <i>n</i> | 146.05 | 0.34 | | |
| 96.298 | 2 <i>n</i> | 153.65 | 0.44 | | |

 Σ 1594.

R. A., 11h 57m.3

Dec., +42° 3'

| | | | | | |
|----------|------|--------------|-----------|------|---|
| 1895.203 | 10.0 | 159.1 | 14.56 | | which I estimate at magnitude 15. Too faint to measure. |
| .217 | | Could barely | see comes | | |

 Σ 1643.

R. A., 12h 21m.2

Dec., +27° 42'

| | | | | | |
|----------|------------|-------|------|--------|--|
| 1894.246 | 10.7 | 40.9 | 1.85 | IV | Seeing suddenly becomes too bad for distance measures. |
| .246 | 10.9 | 41.2 | 1.84 | I | |
| .263 | 10.5 | 41.1 | 1.70 | III | |
| .277 | 10.2 | 40.4 | 1.93 | IV | |
| 1895.320 | 11.8 | 40.5 | 1.85 | IV | |
| .326 | 10.9 | 40.7 | 1.72 | IV | |
| .400 | 12.7 | 40.3 | .... | IV | |
| 1894.257 | 4 <i>n</i> | 40.90 | 1.85 | Means. | |
| 95.323 | 2 <i>n</i> | ..... | 1.78 | | |
| 95.349 | 3 <i>n</i> | 40.50 | .... |  |  |

OBSERVATIONS OF DOUBLE STARS.

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Ocular. | Remarks. |
|-------|----------|----------|----------|---------|----------|
| | <i>h</i> | <i>o</i> | <i>'</i> | | |

 Σ 1647.R. A., 12^h 24^m.5

Dec., +10° 23

| | | | | | |
|----------|------------|--------|------|--------|--------------------|
| 1893.427 | 15.4 | 220.8 | 1.19 | III | 8.5 9. <i>mag.</i> |
| 1894.277 | 10.4 | 220.4 | 1.30 | IV | 7.6 8. |
| .309 | 11.9 | 220.1 | 1.27 | IV | 7. 8. |
| .312 | 10.3 | 220.5 | 1.28 | IV | 7.5 7.8 |
| 1895.320 | 12.0 | 221.2 | 1.26 | IV | |
| .378 | 12.1 | 220.5 | 1.11 | IV | |
| .406 | 13.2 | 220.5 | 1.24 | IV | |
| 1893.427 | 1 <i>n</i> | 220.80 | 1.19 | Means. | |
| 94.300 | 3 <i>n</i> | 220.33 | 1.28 | | |
| 95.368 | 3 <i>n</i> | 220.73 | 1.20 | | |

 Σ 1658.R. A., 12^h 29^m.0

Dec., +8° 5'

| | | | | | |
|----------|------------|--------|------|--------|-----------------------|
| 1893.425 | 14.7 | 355.2 | 2.48 | III | 8. 10. <i>mag.</i> |
| .427 | 15.1 | 357.1 | 2.57 | III | 7.5 9. Badly blurred. |
| 1894.277 | 10.9 | 356.0 | 2.32 | IV | 8. 9. |
| .312 | 11.5 | 354.9 | 2.45 | IV | 8. 9.5 Blurred. |
| .331 | 12.6 | 357.9 | 2.42 | IV | 9. 10. |
| .348 | 12.3 | 356.9 | 2.37 | IV | 8. 9.5 |
| 1895.378 | 12.3 | 356.0 | 2.37 | III | 8. 9. |
| .406 | 13.4 | 356.3 | 2.36 | IV | |
| 1893.426 | 2 <i>n</i> | 356.15 | 2.52 | Means. | |
| 94.316 | 4 <i>n</i> | 356.42 | 2.39 | | |
| 95.392 | 2 <i>n</i> | 356.15 | 2.36 | | |

| Date. | Sid T. | <i>p</i> | <i>s</i> | Ocular. | Remarks. |
|-------|--------|----------|----------|---------|----------|
| | h | ° | ' | | |

Σ 1661.

R. A., 12h 30m.0

Dec., +12° 4'

| | | | | | |
|----------|------|--------|------|--------|----------------------------|
| 1893.425 | 14.4 | 54.9 | 2.30 | III | 8. 8. <i>mag.</i> Blurred. |
| .427 | 14.9 | 234.5 | 2.53 | III | 8. 8.1 |
| 1894.277 | 10.7 | 56.3 | 2.29 | IV | 8. 8.1 |
| .313 | 11.2 | 56.4 | 2.31 | IV | 8.5 8.5 |
| .331 | 12.8 | 236.1 | 2.36 | IV | 9.5 9.6 |
| .348 | 12.0 | 236.4 | 2.13 | IV | 8.5 8.5 |
| 1895.378 | 12.4 | 234.3 | 2.41 | IV | |
| 1893.426 | 2 n | 234.70 | 2.42 | Means. | |
| 91.316 | 4 n | 236.30 | 2.27 | | |
| 95.378 | 1 n | 234.80 | 2.41 | | |

Σ 1670, γ VIRGINIS.

R. A., 12h 35m.6

Dec., -0° 47'

| | | | | | |
|----------|------|-------|------|-----|------------------|
| 1892.468 | 13.4 | 153.4 | 5.64 | IV | |
| .471 | 13.4 | 154.1 | 5.56 | IV | |
| .540 | 12.5 | 333.2 | 5.45 | IV | VI inch. Good. |
| 1893.427 | 12.7 | 333.1 | 5.66 | III | Good. |
| 1894.395 | 11.6 | 151.8 | 5.49 | III | |
| .397 | 11.5 | 152.4 | 5.50 | III | |
| 1895.411 | 12.0 | 152.3 | 5.67 | IV | Confused images. |
| .427 | 13.0 | 331.7 | 5.48 | III | |
| .452 | 13.4 | 332.1 | 5.79 | III | |
| 1896.359 | 12.5 | 331.5 | 5.62 | V | Good. |
| .362 | 12.3 | 331.3 | 5.47 | V | |
| .375 | 12.4 | 332.2 | 5.56 | III | |

OBSERVATIONS OF DOUBLE STARS.

| Date. | Sid. T. | p | s | Ocular. | Remarks. |
|-------|---------|-----|-----|---------|----------|
| | h | ° | ' | | |

 Σ 1670, γ VIRGINIS—Continued.

| | | | | | |
|----------|-----|--------|------|--------|--|
| 1892.498 | 3 n | 333.57 | 5.55 | Means. | |
| 93.427 | 1 n | 333.10 | 5.66 | | |
| 94.396 | 2 n | 332.10 | 5.50 | | |
| 95.480 | 3 n | 332.03 | 5.65 | | |
| 96.365 | 3 n | 331.67 | 5.55 | | |

 Σ 1687, 35 COMAE.

R. A., 12h 47m.4

Dec., +21° 53'

| | | | | | |
|----------|------|-------|------|--------|---------------|
| 1892.463 | 13.9 | 75.9 | 1.19 | IV | |
| .471 | 13.6 | 80.3 | 1.10 | III | Difficult. |
| .487 | 14.8 | 74.5 | 1.06 | IV | |
| 1894.277 | 11.1 | 75.0 | 1.08 | IV | |
| .312 | 10.6 | 78.1 | 1.11 | IV | |
| .348 | 11.2 | 76.9 | 1.04 | IV | Blurred. |
| 1895.378 | 12.7 | 76.7 | 1.13 | IV | Very blurred. |
| .406 | 13.7 | 78.1 | 1.14 | IV | Good. |
| .452 | 13.6 | 76.9 | 1.15 | IV | |
| 1896.255 | 10.3 | 76.8 | 1.10 | IV | |
| .258 | 11.6 | 75.0 | 1.08 | IV | |
| .271 | 12.8 | 77.1 | 1.19 | IV | |
| 1892.475 | 3 n | 76.90 | 1.12 | Means. | |
| 94.312 | 3 n | 76.67 | 1.08 | | |
| 95.412 | 3 n | 77.23 | 1.14 | | |
| 96.261 | 3 n | 76.30 | 1.12 | | |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Ocular. | Remarks. |
|-------|---------|----------|----------|---------|----------|
| | h | ° | ' | | |

O Σ 256.

R. A., 12h 50m.3

Dec., -0° 18'

| | | | | | |
|----------|------|-------|------|--------|--------------------|
| 1894.395 | 12.2 | 73.5 | 0.60 | IV | 8. 8.1 <i>mag.</i> |
| .397 | 12.0 | 74.0 | 0.48 | IV | 8. 8. |
| 1895.809 | 12.5 | 74.9 | 0.61 | IV | |
| .437 | 13.2 | 72.9 | 0.53 | IV | |
| .455 | 13.9 | 73.9 | 0.61 | IV | |
| 1894.396 | 2 n | 73.75 | 0.53 | Means. | |
| 95.397 | 3 n | 73.90 | 0.58 | | |

 Σ 1728, 42 COMAE.

R. A., 13h 4m.2

Dec., +18° 10'

| | | | | | |
|----------|------|------------|------------------|--------|----------------------|
| 1894.277 | 11.3 | 174.0 | 0.20 <i>est.</i> | IV | Elongated. |
| .312 | 10.8 | 182.4 | 0.25 <i>est.</i> | IV | Elongated. |
| .395 | 11.8 | 184.0 | 0.30 <i>est.</i> | IV | Elongated. |
| 1895.309 | 12.3 | 144.3 | 0.15 <i>est.</i> | IV | Elongated. Axes 4:3. |
| .326 | 10.7 | 128. \pm | 0.25 <i>est.</i> | IV | |
| .411 | 12.1 | 184.1 | 0.20 <i>est.</i> | IV | Elongated. |
| 1896.258 | 11.9 | ..... | .... | .... | Blurred. Single. |
| .271 | 13.0 | ..... | .... | .... | Blurred. Single. |
| 1894.227 | 3 n | 180.13 | 0.21 | Means. | |
| 95.349 | 3 n | 152.(?) | 0.16 | | |
| 96.264 | 2 n | Single. | .... |  |  |

 Σ 1733.

R. A., 13h 10m.3

Dec., +17° 53'

| | | | | | |
|----------|------|-------|------|-----|----------|
| 1894.348 | 12.6 | 125.0 | 4.73 | IV | 8.7 10.0 |
| 1895.878 | 13.1 | 122.5 | 5.41 | III | |

OBSERVATIONS OF DOUBLE STARS.

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Ocular. | Remarks. |
|-------|---------|----------|----------|---------|----------|
| | h | o | . | | |

 β 800.

R. A., 13h 10m.8

Dec., +17° 40'

| | | | | | |
|----------|------|--------|------|--------|---------------------------|
| 1894.895 | 12.1 | 114.7 | 2.29 | III | 'Thro' clouds. Difficult. |
| 1895.878 | 13.0 | 118.4 | 2.44 | III | |
| .411 | 12.7 | 112.8 | 2.68 | IV | |
| 1896.875 | 12.8 | 118.9 | 2.51 | V | |
| .886 | 12.6 | 112.1 | 2.50 | V | |
| .406 | 12.7 | 118.4 | 2.49 | V | Poor. |
| 1894.895 | 1 n | 114.70 | 2.29 | Means. | |
| 95.895 | 2 n | 115.60 | 2.56 | | |
| 96.889 | 3 n | 118.18 | 2.50 | | |

 α 266.

R. A., 13h 22m.5

Dec., +16° 22'

| | | | | | |
|----------|------|--------|------|--------|-------------|
| 1893.581 | 17.4 | 339.8 | 1.34 | IV | 7.5 8. mag. |
| 1894.848 | 12.9 | 340.0 | 1.64 | IV | 7.5 8. |
| .878 | 11.8 | 339.2 | 1.86 | III | 7. 8. |
| .895 | 12.6 | 339.8 | 1.58 | IV | 8. 8.2 |
| 1895.452 | 13.8 | 342.2 | 1.61 | IV | |
| .455 | 14.1 | 341.4 | 1.57 | IV | |
| 1893.581 | 1 n | 339.80 | 1.34 | Means. | |
| 94.874 | 3 n | 339.67 | 1.53 | | |
| 95.454 | 2 n | 341.80 | 1.59 | | |

 α 269.

R. A., 13h 27m.5

Dec., +35° 32'

| | | | | | |
|----------|------|------|------|----|-----------------------------|
| 1892.594 | 17.0 | .... | .... | IX | Single. |
| 1893.581 | 17.0 | .... | .... | IV | Suspect elongation in 200°. |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Ocular. | Remarks. |
|-------|----------|----------|----------|---------|----------|
| | <i>h</i> | <i>o</i> | <i>s</i> | | |

O Σ 269 — Continued.

| | | | | | |
|----------|------------|-------|------------------|--------|-----------------------------|
| 1894.277 | 11.9 | .... | .... | IV | Suspect elongation in 170°. |
| .895 | 12.5 | 210.5 | 0.80 <i>est.</i> | IV | Wedge shaped. |
| 1896.271 | 12.8 | 210.8 | 0.25 <i>est.</i> | IV | Elongated. |
| .320 | 10.1 | 180.9 | 0.25 <i>est.</i> | IV | Doubtful elongation. |
| .884 | 11.7 | 40.6 | 0.80 <i>est.</i> | IV | Elongated. |
| 1894.895 | 1 <i>n</i> | 210.5 | 0.28 | Means. | |
| 96.808 | 8 <i>n</i> | 204.1 | 0.28 | | |

 Σ 1757.

R. A., 18h 28m.2

Dec., +0° 18'

| | | | | | |
|----------|------------|-------|------|--------|--------------|
| 1892.487 | 15.5 | 74.5 | 2.38 | IV | Poor seeing. |
| .587 | 15.8 | 74.0 | 2.19 | VI | |
| .553 | 16.6 | 72.7 | 2.46 | IV | |
| 1894.805 | 12.8 | 75.1 | 2.41 | IV | |
| 1895.427 | 13.4 | 74.6 | 2.32 | IV | |
| .452 | 14.0 | 75.5 | 2.45 | IV | |
| .455 | 14.2 | 74.8 | 2.35 | IV | |
| 1892.526 | 8 <i>n</i> | 73.73 | 2.34 | Means. | |
| 94.895 | 1 <i>n</i> | 75.10 | 2.41 | | |
| 95.445 | 8 <i>n</i> | 74.97 | 2.37 | | |

 Σ 1768, 25 CAN. VEN.

R. A., 18h 32m.1

Dec., +36° 54'

| | | | | | |
|----------|------|-------|----------|----|---------------------------|
| 1892.623 | 18.2 | 141.0 | 1.01 | IV | Blurred. Very indistinct. |
| .649 | 18.2 | 139.7 | 0.88 | IV | |
| .666 | 18.3 | 139.3 | 0.71 (?) | IV | |

5—OB.

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Ocular. | Remarks. |
|-------|---------|----------|----------|---------|----------|
| | h | o | ' | | |

Σ 1768, 25 CAN. VEN. — Continued.

| | | | | | |
|----------|------------|--------|------|--------|------------------|
| 1893.581 | 17.0 | 188.9 | 0.89 | IV | Good definition. |
| 1895.520 | 17.8 | 188.6 | 0.98 | IV | |
| .528 | 15.1 | 186.2 | 0.88 | IV | |
| 1896.271 | 12.1 | 184.4 | 1.15 | IV | |
| .320 | 9.9 | 187.8 | 1.04 | IV | Fair. |
| .334 | 11.5 | 183.0 | 1.02 | IV | |
| 1892.646 | 3 <i>n</i> | 140.00 | 0.94 | Means. | |
| 93.581 | 1 <i>n</i> | 188.90 | 0.89 | | |
| 95.522 | 2 <i>n</i> | 187.40 | 0.90 | | |
| 96.308 | 3 <i>n</i> | 185.07 | 1.07 | | |

β 612. B. A. C. 4549.

R. A., 18h 33m.6

Dec., +11° 21'

| | | | | | |
|----------|------------|--------|------------------|--------|-------------------------|
| 1893.581 | 17.5 | ..... | .... | IV | Cannot separate. |
| 1894.277 | 12.1 | 202.1 | 0.80 <i>est.</i> | IV | Blurred and uncertain. |
| .395 | 18.0 | 205.3 | 0.85 <i>est.</i> | IV | Notched. |
| 1895.809 | 12.7 | 209.6 | 0.25 <i>est.</i> | IV | Elongated. |
| .411 | 12.5 | 207.9 | 0.80 <i>est.</i> | IV | Not separated. Blurred. |
| .471 | 15.3 | 211.5 | 0.80 <i>est.</i> | IV | Not separated. |
| .482 | 14.5 | 219.4 | 0.25 <i>est.</i> | IV | Elongated. |
| 1896.334 | 12.2 | 211.6 | 0.40 <i>est.</i> | IV | Elongated. |
| .416 | 12.7 | 218.4 | 0.40 <i>est.</i> | IV | Not separated. |
| 1893.581 | 1 <i>n</i> | Single | .... | Means. | |
| 94.286 | 2 <i>n</i> | 203.70 | 0.29 | | |
| 95.418 | 4 <i>n</i> | 212.10 | 0.24 | | |
| 96.375 | 2 <i>n</i> | 212.50 | 0.37 | | |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Ocular. | Remarks. |
|-------|----------|----------|----------|---------|----------|
| | <i>h</i> | <i>°</i> | <i>'</i> | | |

Σ 1777, 84 VIRGINIS.

R. A., 13h 37m.3

Dec., +4° 9'

| | | | | | |
|----------|------|--------|------|--------|---|
| 1893.425 | 15.0 | 228.5 | 3.50 | III | 6. 8.5 <i>mag.</i> Blurred and unsteady. Good. |
| .564 | 17.8 | 229.2 | 3.84 | III | |
| .575 | 17.1 | 230.7 | 3.50 | IV | |
| 1895.411 | 12.4 | 231.0 | 3.22 | III | |
| .427 | 13.6 | 230.6 | 3.10 | IV | 5. 8.5 5. 9. |
| .455 | 14.4 | 230.8 | 3.24 | IV | |
| 1896.334 | 12.4 | 231.1 | 3.30 | IV | |
| .359 | 12.7 | 231.1 | 3.35 | IV | |
| .375 | 13.1 | 232.5 | 2.88 | V | |
| 1893.521 | 3 n | 229.47 | 3.45 | Means. | |
| 95.431 | 3 n | 230.80 | 3.19 | | |
| 96.856 | 3 n | 231.57 | 3.18 | | |

Σ 1781.

R. A., 13h 40m.2

Dec., +5° 43'

| | | | | | |
|----------|------|--------|------|--------|-----------------------------------|
| 1893.564 | 17.6 | 267.6 | 0.78 | III | 8.5-9 <i>mag.</i> Very bad seeing |
| .575 | 17.3 | 269.6 | 0.77 | IV | |
| 1894.395 | 13.2 | 268.5 | 0.90 | IV | |
| 1895.453 | 14.2 | 270.3 | 0.74 | IV | |
| .455 | 14.5 | 271.4 | 0.76 | IV | 8. -9 Blurred. 8. -9 |
| 1893.570 | 2 n | 268.60 | 0.78 | Means. | |
| 94.395 | 1 n | 268.50 | 0.90 | | |
| 95.454 | 2 n | 270.85 | 0.75 | | |

OBSERVATIONS OF DOUBLE STARS.

| Date. | Sid. T. | p | s | Ocular. | Remarks. |
|-------|---------|-----|-----|---------|----------|
| | h | ° | ' | | |

O Σ 270, τ Bootis.

R. A., 13h 41m.6

Dec., +18° 4'

| | | | | | |
|----------|------|--------|------|--------|---------------|
| 1894.895 | 13.4 | 354.1 | 8.46 | III |11.5 mag. |
| 1895.471 | 15.2 | 355.8 | 8.35 | IV |12. |
| .520 | 16.6 | 356.8 | 8.52 | I | |
| 1896.406 | 18.0 | 356.1 | 8.84 | I | |
| .411 | 18.8 | 355.5 | 8.44 | V | |
| 1894.895 | 1 n | 354.10 | 8.46 | Means. | |
| 95.496 | 2 n | 356.30 | 8.44 | | |
| 96.408 | 2 n | 355.80 | 8.39 | | |

 Σ 1785.

R. A., 18h 43m.6

Dec., +27° 33'

| | | | | | |
|----------|------|--------|------|--------|-------|
| 1892.468 | 14.4 | 249.6 | 1.88 | III | |
| .471 | 14.4 | 248.7 | 1.46 | IV | |
| .487 | 15.1 | 245.9 | 1.39 | IV | |
| 1895.520 | 16.7 | 259.0 | 1.49 | IV | |
| .523 | 15.3 | 260.0 | 1.45 | IV | |
| 1896.271 | 12.2 | 261.8 | 1.50 | IV | Good. |
| .320 | 10.4 | 264.6 | 1.87 | IV | Good. |
| .406 | 13.2 | 261.1 | 1.84 | V | |
| .411 | 13.7 | 261.7 | 1.47 | IV | |
| 1892.475 | 3 n | 248.07 | 1.39 | Means. | |
| 95.523 | 2 n | 259.50 | 1.47 | | |
| 96.353 | 4 n | 262.30 | 1.42 | | |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Ocular. | Remarks. |
|-------|---------|----------|----------|---------|----------|
| | h | ° | ' | | |

Σ 1788.

R. A , 18^h 48^m.6

Dec., -7° 28'

| | | | | | |
|----------|------|-------|------|--------|--|
| 1895.471 | 15.0 | 74.4 | 2.61 | IV | |
| .492 | 14.4 | 75.7 | 2.51 | IV | |
| 1896.375 | 13.2 | 77.6 | 2.49 | V | |
| .406 | 13.4 | 75.9 | 2.66 | III | |
| .411 | 13.5 | 76.4 | 2.65 | V | |
| 1895.476 | 2 n | 75.05 | 2.56 | Means. | |
| 96.397 | 3 n | 76.63 | 2.60 | | |

OΣ 278.

R. A., 14^h 7^m.5

Dec., +44° 45'

| | | | | | |
|----------|------|--------|-----------|--------|----------------------|
| 1893.570 | 18.7 | 95.2 | 0.34 | IV | Separation doubtful. |
| .581 | 17.8 | 99.8 | 0.39 | IV | 8.-8.5 mag. |
| 1895.471 | 16.2 | 96.7 | 0.35 est. | IV | Notched. |
| .520 | 17.2 | 282.1 | 0.25 est. | IV | Not separated. |
| .586 | 16.7 | 92.8 | 0.30 est. | IV | Elongated. |
| 1896.271 | 12.6 | 99.6 | 0.30 est. | IV | Not separated. |
| .320 | 10.2 | 107.8 | 0.30 est. | IV | Elongated. |
| .334 | 11.2 | 97.9 | 0.29 | IV | Separated. |
| 1893.576 | 2 n | 97.50 | 0.36 | Means. | |
| 95.526 | 3 n | 97.20 | 0.26 | | |
| 96.308 | 3 n | 101.77 | 0.27 | | |

Σ 1820.

R. A., 14^h 8^m.8

Dec., +55° 53'

| | | | | | |
|----------|------|-------|------|-------|--|
| 1893.570 | 18.1 | 71.1 | 2.05 | IV | |
| .581 | 18.1 | 73.2 | 2.27 | IV | |
| 1893.576 | 2 n | 72.15 | 2.16 | Mean. | |

OBSERVATIONS OF DOUBLE STARS.

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Ocular. | Remarks. |
|-------|---------|----------|----------|---------|----------|
| | h | . | ' | | |

Σ 1819.

R. A., 14^h 9^m.5

Dec., +8° 42'

| | | | | | |
|----------|------|-------|------|--------|--|
| 1892.471 | 14.2 | 183.8 | 1.32 | IV | |
| .487 | 15.7 | 188.3 | 1.33 | IV | |
| .553 | 16.8 | 188.6 | 1.36 | IV | |
| .583 | 18.0 | 187.4 | 1.21 | IV | |
| 1895.452 | 14.5 | 188.4 | 1.43 | IV | |
| .471 | 15.5 | 4.2 | 1.40 | IV | |
| .523 | 15.5 | 4.5 | 1.37 | IV | |
| 1892.524 | 4 n | 7.02 | 1.30 | Means. | |
| 95.482 | 3 n | 4.03 | 1.40 | | |

Σ 1830.

R. A., 14^h 12^m.2

Dec., +57° 11'

| | | | | | |
|----------|------|-------|------|---|--|
| 1896.416 | 13.1 | 289.8 | 6.02 | I | |
|----------|------|-------|------|---|--|

Σ 1831.

R. A., 14^h 12^m.7

Dec., +57° 13'

| | | | | | |
|----------|------|--------|------|--------|--------------|
| 1893.381 | 18.6 | 144.0 | 5.93 | III | 6.5 .10 mag. |
| 1895.471 | 16.4 | 142.2 | 5.95 | IV | |
| .476 | 16.6 | 142.9 | 6.22 | IV | |
| .529 | 16.8 | 141.4 | 5.85 | IV | |
| 1893.581 | 1 n | 144.00 | 5.93 | Means. | |
| 95.492 | 3 n | 142.17 | 6.01 | | |

| Date. | Sid T. | <i>p</i> | <i>s</i> | Ocular. | Remarks. |
|-------|----------|----------|----------|---------|----------|
| | <i>h</i> | . | , | | |

Σ 1834.

R. A., 14h 15m.9

Dec., +49° 4'

| | | | | | |
|----------|------|-------|------------------|------|--------------------------------|
| 1898.570 | 18.2 | .... | .... | ... | Elongated in $p = 150^\circ$. |
| .581 | 18.2 | 298.6 | 0.25 <i>est.</i> | .... |  |
| 1895.471 | 16 5 | .... | .... | .... | Single. Rather poor seeing. |
| .581 | 17.5 | .... | .... | .... | Single. Good seeing. |

Σ 1837.

R. A., 14h 18m.2

Dec., -11° 8'

| | | | | | |
|----------|------------|--------|------|--------|--------------------------|
| 1895.490 | 15.1 | 308.8 | 1.15 | IV | Cloudy, but fair seeing. |
| .520 | 15.8 | 308.0 | 1.23 | IV | Rather blurred. |
| .523 | 15.5 | 304.8 | 1.11 | IV | Wind shaking telescope. |
| 1896.375 | 13.4 | 309.8 | 1.3± | III | Very blurred. |
| .406 | 14.1 | 307.1 | 1.48 | III | Blurred. |
| .411 | 13.8 | 309.4 | 1.23 | IV | Blurred. |
| .425 | 14.1 | 303.1 | 1.27 | III | |
| 1895.511 | 8 <i>n</i> | 305.87 | 1.16 | Means. | |
| 96.404 | 4 <i>n</i> | 307.85 | 1.33 | | |

Σ 1863.

R. A., 14h 34m.0

Dec., +52° 9'

| | | | | | |
|----------|------------|-------|------|--------|----------|
| 1895.471 | 16.7 | 90.6 | 0.44 | IV | Blurred. |
| .575 | 17.8 | 91.9 | 0.49 | IV | |
| .581 | 17.7 | 90.0 | 0.56 | IV | |
| 1896.416 | 13.8 | 91.8 | 0.58 | IV | |
| 1895.542 | 8 <i>n</i> | 90.83 | 0.50 | Means. | |
| 96.416 | 1 <i>n</i> | 91.80 | 0.58 | | |

OBSERVATIONS OF DOUBLE STARS.

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Ocular. | Remarks. |
|-------|----------|----------|----------|---------|----------|
| | <i>h</i> | <i>°</i> | <i>'</i> | | |

Σ 1876.

R. A., 14^h 40^m 0

Dec., -6° 58'

| | | | | | |
|----------|------------|-------|------|-------|----------------------------|
| 1895.468 | 15.6 | 75.6 | 0.93 | IV | Very blurred. |
| .490 | 15.8 | 73.9 | 1.02 | IV | Through clouds. Difficult. |
| .520 | 15.5 | 75.9 | 1.09 | IV | Good seeing. |
| 1895.493 | 8 <i>n</i> | 75.18 | 1.01 | Mean. | |

Σ 1879.

R. A., 14^h 40^m.4

Dec., +10° 9'

| | | | | | |
|----------|------|-------|------|------|---------|
| 1894.490 | 15.5 | ..... | .... | .... | Single. |
| .520 | 15.6 | ..... | .... | .... | Single. |
| 96.425 | 14.2 | 150.7 | 0.47 | IV | Good. |

OΣ 285.

R. A., 14^h 41^m.0

Dec., +42° 53'

| | | | | | |
|----------|------------|--------|------------------|--------|----------------|
| 1898.570 | .... | Cannot | separate. | .... | Fine seeing. |
| 1895.471 | 16.8 | 325.3 | 0.25 <i>est.</i> | IV | Wedge shaped. |
| .575 | 17.7 | 318.9 | 0.25 <i>est.</i> | IV | |
| .581 | 17.4 | 319.0 | 0.20 <i>est.</i> | IV | Elongated. |
| 1896.416 | 18.5 | 324.5 | 0.30 <i>est.</i> | IV | Not separated. |
| .444 | 18.2 | 144.2 | 0.33 | IV | Good. |
| 1895.542 | 3 <i>n</i> | 141.07 | 0.19 | Means. | |
| 96.430 | 2 <i>n</i> | 144.35 | 0.30 | | |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Ocular. | Remarks. |
|-------|---------|----------|----------|---------|----------|
| | h | ° | ' | | |

Σ 1888, ξ Bootis.

R. A., 14h 45m.8

Dec., +19° 36'

| | | | | | |
|----------|------|--------|------|--------|---------------------------------|
| 1892.468 | 14.2 | 238.8 | 3.03 | III | Rather poor seeing. Blurred. |
| .471 | 13.9 | 238.3 | 2.95 | IV | |
| .537 | 15.5 | 238.8 | 2.74 | IV | |
| 1895.468 | 15.9 | 227.3 | 2.89 | IV | |
| .476 | 14.5 | 224.7 | 2.94 | IV | |
| .523 | 15.9 | 227.1 | 2.81 | III | |
| 1896.406 | 14.8 | 221.3 | 2.87 | V | |
| .425 | 14.4 | 223.5 | 2.71 | IV | |
| .644 | 18.3 | 223.3 | 2.82 | IV | |
| 1892.492 | 3 n | 228.80 | 2.91 | Means. | |
| 95.489 | 3 n | 226.87 | 2.88 | | |
| 96.492 | 3 n | 222.70 | 2.80 | | |

SOUTH 190.

R. A., 14h 50m.5

Dec., -20° 52'

| | | | | | |
|----------|------|-------|-------|---|--|
| 1896.406 | 14.5 | 293.6 | 16.76 | V | |
|----------|------|-------|-------|---|--|

Σ 1909, 44 Bootis.

R. A., 15h 0m.0

Dec., +48° 8'

| | | | | | |
|----------|------|--------|------|--------|--|
| 1892.570 | 16.9 | 240.9 | 4.81 | III | |
| .608 | 18.4 | 241.7 | 4.86 | IV | |
| 1895.471 | 17.1 | 240.0 | 4.78 | IV | |
| .476 | 16.8 | 242.3 | 4.73 | IV | |
| .529 | 17.1 | 241.1 | 4.66 | III | |
| 1892.584 | 3 n | 241.80 | 4.84 | Means. | |
| 95.492 | 3 n | 241.13 | 4.73 | | |
| | | | | | |
| | | | | | |
| | | | | | |

OBSERVATIONS OF DOUBLE STARS.

| Date. | Sid. T. | p | s | Ocular. | Remarks. |
|-------|---------|-----|-----|---------|----------|
| | h | ° | ' | | |

Σ 1932.

R. A., 15h 13m.2

Dec., +27° 18'

| | | | | | |
|----------|------|--------|------|--------|-----------------|
| 1892.622 | 18.0 | 319.0 | 0.71 | IV | |
| .633 | 18.4 | 318.2 | 0.69 | IV | Images blurred. |
| .649 | 18.4 | 319.4 | 0.88 | IV | |
| .666 | 18.7 | 318.7 | 0.62 | IV | Blurred. |
| 1893.714 | 19.7 | 322.2 | 0.72 | IV | Blurred. |
| 1895.468 | 16.2 | 321.4 | 0.74 | IV | Blurred. |
| .476 | 14.6 | 323.8 | 0.60 | IV | |
| .551 | 15.8 | 327.2 | 0.76 | IV | |
| 1896.406 | 14.7 | 322.2 | 0.66 | IV | Very blurred. |
| .416 | 18.8 | 324.7 | 0.69 | IV | |
| .425 | 14.5 | 325.8 | 0.63 | IV | |
| 1892.642 | 4 n | 318.82 | 0.71 | Means. | |
| 93.714 | 1 n | 322.20 | 0.72 | | |
| 95.498 | 3 n | 324.13 | 0.70 | | |
| 96.416 | 3 n | 324.23 | 0.66 | | |

Σ 1937, η CORONAE BOREALIS.

R. A., 15h 18m.3.

Dec., +86° 43'

| | | | | | |
|----------|------|-------|------------------|-----|------------------|
| 1892.622 | 18.4 | 230.3 | 0.48 | III | |
| .649 | 18.5 | 228.5 | 0.52 | IV | |
| .681 | 18.4 | 230.7 | 0.44 | IV | |
| 1895.482 | 16.7 | 234.0 | 0.30 <i>est.</i> | IV | Not separated. |
| .518 | 16.2 | 233.5 | 0.30 <i>est.</i> | IV | Not separated. |
| .523 | 16.0 | 230.1 | 0.30 <i>est.</i> | IV | Images touching. |

| Date. | Sid. T. | p | s | Ocular. | Remarks. |
|-------|---------|-----|-----|---------|----------|
| | h | o | r | | |

 Σ 1937, η CORONAE BOREALIS — Continued.

| | | | | | |
|----------|------|--------|------------------|--------|------------|
| 1896.416 | 18.7 | 310.4 | 0.39 | IV | Separated. |
| .444 | 18.5 | 311.1 | 0.42 | IV | |
| .600 | 18.4 | 317.4 | 0.35 <i>est.</i> | IV | Separated. |
| .602 | 18.5 | 317.8 | 0.42 | IV | |
| 1892.651 | 3 n | 229.83 | 0.48 | Means. | |
| 95.408 | 3 n | 285.87 | 0.26 | | |
| 96.516 | 4 n | 314.18 | 0.38 | | |

 Σ 28, $\mu^1 - \mu^2$ BOOTIS.

R. A., 15h 20m.0

Dec., +37° 47'

| | | | | | |
|----------|------|--------|--------|-------|-------|
| 1895.520 | 18.1 | 171.5 | 108.43 | I | Good. |
| .575 | 16.7 | 171.7 | 108.11 | III | |
| 1895.548 | 2 n | 171.60 | 108.27 | Mean. | |

 Σ 1938, μ^2 BOOTIS.

R. A., 15h 20m.0

Dec., +37° 44'

| | | | | | |
|----------|------|------|------|----|--|
| 1892.575 | 17.2 | 87.4 | 0.53 | IV | |
| .578 | 17.0 | 89.0 | 0.77 | IV | |
| .583 | 18.3 | 92.1 | 0.77 | IV | |
| .594 | 17.2 | 87.9 | 0.69 | IV | |
| 1895.482 | 16.9 | 82.3 | 0.61 | IV | |
| .520 | 17.6 | 84.8 | 0.66 | IV | |
| .575 | 16.9 | 84.5 | 0.65 | IV | |
| 1896.416 | 14.0 | 83.9 | 0.75 | IV | |
| .444 | 18.7 | 84.8 | 0.67 | IV | |
| .602 | 18.7 | 80.6 | 0.76 | IV | |

OBSERVATIONS OF DOUBLE STARS.

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Ocular. | Remarks. |
|-------|---------|----------|----------|---------|----------|
| | h | ° | ' | | |

Σ 1938, μ^* Bootis — Continued.

| | | | | | |
|----------|------------|-------|------|--------|--|
| 1892.582 | 4 <i>n</i> | 89.10 | 0.69 | Means. | |
| 95.526 | 3 <i>n</i> | 83.87 | 0.64 | | |
| 96.487 | 3 <i>n</i> | 83.10 | 0.73 | | |

OΣ 298. A. B.

R. A., 15h 31m.7

Dec., +40° 18'

| | | | | | |
|----------|------------|--------|------|--------|------------------------|
| 1892.572 | 17.2 | 167.9 | 0.68 | IV | |
| .588 | 18.7 | 169.4 | 0.63 | IV | |
| .594 | 17.5 | 169.5 | 0.59 | IV | |
| .613 | 18.2 | 168.7 | 0.64 | IV | Stars woolly. |
| 1893.714 | 20.2 | 173.6 | 0.64 | IV | Blurred. |
| 1895.471 | 17.4 | 173.0 | 0.87 | IV | |
| .575 | 17.1 | 173.1 | 0.81 | IV | Good. |
| .581 | 17.3 | 173.3 | 0.87 | IV | Good. |
| 1896.416 | 14.2 | 185.9 | 0.52 | IX | Blurred but separated. |
| .444 | 18.7 | 175.4 | 0.90 | IV | |
| .602 | 18.9 | 175.3 | 0.96 | IV | Good. |
| 1892.567 | 4 <i>n</i> | 169.88 | 0.64 | Means. | |
| 93.714 | 1 <i>n</i> | 173.60 | 0.64 | | |
| 95.542 | 3 <i>n</i> | 173.13 | 0.85 | | |
| 96.487 | 3 <i>n</i> | 178.87 | 0.79 | | |

Σ 1967. γ CORONAE.

R. A., 15h 37m.7

Dec., +26° 40'

| | | | | | |
|----------|------|-------|-----------------|----|---------------------|
| 1892.681 | 18.7 | 123.7 | 0.5 <i>est.</i> | IV | Bad seeing. |
| .711 | 17.2 | 120.6 | 0.30 | IV | Daylight obs. |
| .788 | 19.0 | 121.6 | 0.39 | IV | Daylight. Good obs. |

| Date. | Sid T. | <i>p</i> | <i>s</i> | Ocular. | Remarks. |
|-------|--------|----------|----------|---------|----------|
| | h | ° | ' | | |

Σ 1967. γ CORONAE — Continued.

| | | | | | |
|----------|------|--------|------|--------|---------------|
| 1895.523 | 16.2 | 118.8 | 0.44 | IV | Very blurred. |
| .551 | 16.1 | 114.8 | 0.41 | IV | Blurred. |
| .567 | 15.8 | 118.2 | 0.44 | IV | Fairly good. |
| 1896.600 | 18.1 | 126.8 | 0.47 | IV | Separated. |
| .602 | 19.1 | 121.8 | 0.42 | IV | |
| .644 | 18.1 | 119.7 | 0.43 | IV | |
| .647 | 18.2 | 121.8 | 0.53 | IV | Good. |
| 1892.727 | 3 n | 121.97 | 0.39 | Means. | |
| 95.547 | 3 n | 117.10 | 0.43 | | |
| 96.628 | 4 n | 122.40 | 0.46 | | |

Σ 1998. ξ LIBRÆ. A B.

R. A., 15h 57m.8

Dec., -11° 3'

| | | | | | |
|----------|------|-------|------|--------|------------------------|
| 1892.570 | 15.7 | 23.4 | 0.76 | IV | Wind. |
| .575 | 16.7 | 28.0 | 0.77 | IV | |
| .583 | 17.6 | 27.9 | 0.88 | IV | |
| .594 | 16.6 | 26.6 | 0.89 | IV | Good. |
| 1895.468 | 16.4 | 32.4 | 0.70 | IV | Blurred and difficult. |
| .551 | 16.2 | 34.0 | 0.95 | IV | Blurred and difficult. |
| .567 | 16.1 | 33.8 | 0.77 | IV | |
| 1896.647 | 17.8 | 37.6 | 0.75 | IV | |
| .652 | 17.7 | 37.6 | 0.75 | IV | |
| 1892.580 | 4 n | 26.48 | 0.82 | Means. | |
| 95.529 | 3 n | 33.40 | 0.81 | | |
| 96.650 | 2 n | 37.60 | 0.75 | | |

OBSERVATIONS OF DOUBLE STARS.

| Date. | Sid. T. | p | s | Ocular. | Remarks. |
|-------|---------|-----|-----|---------|----------|
| | h | o | ' | | |

Σ 1998. ξ LIBRAE. $\frac{1}{2}$ (A+B), C.

R. A., 15^h 57^m.8

Dec., -11° 2'

| | | | | | |
|-----------------------|------|-------|------|--------|---|
| 1892.575 ¹ | 16.9 | 70.8 | 6.85 | IV | Diffuse. X inch. Difficult. Wind and bad seeing. Blurred and difficult. |
| .583 ¹ | 17.8 | 67.9 | 7.11 | IV | |
| .594 | 16.8 | 67.0 | 7.04 | IV | |
| 1895.468 | 16.6 | 68.9 | 7.28 | IV | |
| .551 ¹ | 16.4 | 66.7 | 7.14 | IV | |
| .567 ¹ | 16.2 | 65.4 | 7.37 | IV | |
| 1896.444 | 15.5 | 63.7 | 7.14 | III | |
| .647 | 18.0 | 63.8 | 7.71 | IV | |
| .652 | 17.9 | 63.6 | 7.38 | IV | |
| 1892.584 | 8 n | 68.57 | 7.00 | Means. | |
| 95.529 | 3 n | 65.33 | 7.26 | | |
| 96.581 | 8 n | 63.70 | 7.41 | | |

¹ On these dates the position angle and distance of AC were the quantities actually observed. The position angles and distances given above have been derived from the measured quantities by a solution of the triangle ABC.

Σ 2034.

R. A., 16^h 3^m.0

Dec., +83° 56'

| | | | | | |
|----------|------|--------|-------|-------|--|
| 1894.263 | 9.4 | 116.4 | 0.91 | III | Blurred. |
| 1895.695 | 22.2 | 113.8 | 1.17 | IV | Blurred. |
| .709 | 18.9 | 117.5 | 0.99 | IV | Blurred. |
| .753 | 21.5 | 113.6 | 1.22; | IV | Very blurred. |
| .769 | 20.5 | 115.1 | 1.05 | IV | Blurred. |
| .780 | 20.3 | 115.0 | 1.30; | IV | Measured by glimpses thro' clouds. Unsatisfactory. |
| .791 | 22.0 | 115.6 | 1.05 | III | Good. |
| .862 | 21.4 | 113.3 | 1.27 | III | Thro' clouds. Faint. |
| 1895.579 | 8 n | 115.04 | 1.12 | Mean. | |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Ocular. | Remarks. |
|-------|---------|----------|----------|---------|----------|
| | h | . | . | | |

 Σ 2021, 49 SERPENTIS.

R. A., 16h 7m.7

Dec., +13° 50'

| | | | | | |
|----------|------|--------|------|--------|--|
| 1895.468 | 17.1 | 332.3 | 4.10 | IV | |
| .476 | 14.8 | 332.5 | 3.91 | IV | |
| .523 | 16.4 | 334.1 | 3.83 | III | |
| 1896.406 | 15.1 | 332.2 | 3.80 | V | |
| 1895.489 | 3 n | 332.97 | 3.95 | Means. | |
| 96.406 | 1 n | 332.20 | 3.80 | | |

 Σ 2032, σ CORONAE.

R. A., 16h 9m.9

Dec., +34° 10'

| | | | | | |
|----------|------|--------|------|--------|-------|
| 1892.570 | 17.5 | 209.5 | 4.17 | IV | Good. |
| .575 | 16.5 | 211.0 | 3.95 | IV | |
| .711 | 19.4 | 209.1 | 4.06 | III | |
| 1895.476 | 14.1 | 210.6 | 4.24 | IV | |
| .482 | 17.2 | 211.0 | 4.28 | IV | |
| .520 | 18.2 | 210.7 | 4.32 | III | |
| 1896.406 | 14.9 | 208.0 | 4.26 | V | |
| 1892.619 | 3 n | 209.87 | 4.06 | Means. | |
| 95.493 | 3 n | 210.77 | 4.28 | | |
| 96.406 | 1 n | 208.00 | 4.26 | | |

 β 814.

R. A., 16h 23m.2

Dec., +40° 9'

| | | | | | |
|----------|------|-----------|-----------|-----|----------------|
| 1893.570 | 19.0 | 318.9 | 0.25 est. | IV | |
| 1895.471 | 17.6 | 330.4 | 0.30 est. | IV | |
| .575 | .... | Elongated | in 130° | IV | |
| .581 | 17.8 | 328.3 | 0.25 est. | IV | Not separated. |
| .832 | 20.3 | 331.5 | 0.25 est. | III | Not separated. |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Ocular. | Remarks. |
|-------|---------|----------|----------|---------|----------|
| | h | ° | ' | | |

 β 814 — Continued.

| | | | | | |
|----------|------------|--------|------------------|--------|------------|
| 1896.416 | 14.4 | 341.9 | 0.25 <i>est.</i> | IV | Elongated. |
| .444 | 14.0 | 321.9 | 0.25 <i>est.</i> | IV | |
| 1898.570 | 1 <i>n</i> | 318.90 | 0.21 | Means. | |
| 95.628 | 3 <i>n</i> | 328.40 | 0.23 | | |
| 96.430 | 2 <i>n</i> | 331.90 | 0.21 | | |

 Σ 2055. λ OPHIUCHI.

R. A., 16h 24m.9

Dec., +2° 14'

| | | | | | |
|----------|------------|-------|------|--------|---------------------|
| 1892.632 | 18.9 | 45.8 | 1.64 | IV | Blazing. |
| .706 | 19.1 | 44.1 | 1.35 | VI | Bad seeing. |
| .711 | 17.0 | 45.5 | 1.22 | VI | Daylight. Good obs. |
| 1895.476 | 17.0 | 45.5 | 1.32 | IV | Very blurred. |
| .529 | 16.5 | 49.1 | 1.19 | IV | Very blurred. |
| .551 | 16.6 | 48.3 | 1.32 | IV | |
| 1896.406 | 15.2 | 51.4 | 1.37 | IV | |
| .589 | 16.8 | 51.5 | 1.49 | IV | |
| .600 | 17.9 | 49.2 | 1.34 | IV | |
| 1892.680 | 3 <i>n</i> | 45.13 | 1.40 | Means. | |
| 95.519 | 3 <i>n</i> | 47.68 | 1.28 | | |
| 96.532 | 3 <i>n</i> | 50.70 | 1.40 | | |

 Σ 3105.

R. A., 16h 25m.4

Dec., -6° 47'

| | | | | | |
|----------|------------|-------|------------------|-------|----------|
| 1895.567 | 16.4 | 35.4 | 0.38 | IV | Blurred. |
| .581 | 16.5 | 34.9 | 0.40 | IV | |
| .586 | 16.8 | 34.5 | 0.40 <i>est.</i> | IV | |
| 1895.578 | 3 <i>n</i> | 34.93 | 0.38 | Mean. | |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Ocular. | Remarks. |
|-------|----------|----------|----------|---------|----------|
| | <i>h</i> | <i>°</i> | <i>'</i> | | |

Σ 2084, ζ HERCULIS.

R. A., 16h 36m.8

Dec., +31° 49'

| | | | | | |
|----------|------|-------|-------|--------|------------------------|
| 1892.553 | 19.3 | 53.1 | 1.43 | IV | |
| .564 | 19.0 | 55.7 | 1.63 | IV | |
| .570 | 17.8 | 57.9 | 1.50 | IV | Fine seeing. |
| .575 | 16.2 | 54.7 | 1.53 | IV | X inch. Blazing. |
| .613 | 17.0 | 56.2 | 1.50 | IV | Blazing. |
| 1895.551 | 17.5 | 30.9 | 1.1± | IV | Very bad seeing. |
| .567 | 16.7 | 29.7 | 1.01 | IV | |
| .575 | 17.9 | 32.1 | 0.95± | IV | Distance very poor. |
| .581 | 18.0 | 28.3 | 0.95 | IV | Good. |
| 1896.416 | 14.8 | 16.4 | 0.65 | IV | Blurred and difficult. |
| .596 | 17.3 | 12.3 | 0.63 | IV | Good. |
| .647 | 17.6 | 13.3 | 0.65 | IV | Blurred. |
| .657 | 17.6 | 14.8 | 0.63 | IV | Good. |
| 1892.575 | 5 n | 55.20 | 1.52 | Means. | |
| 95.568 | 4 n | 30.25 | 0.98 | | |
| 96.576 | 4 n | 14.30 | 0.64 | | |

Ad. Σ 2091. (DEMBOWSKI).

R. A., 16h 41m

Dec., +43° 42'

| | | | | | |
|----------|------|-------|------|----|-----------------------|
| 1892.542 | 18.6 | 353.1 | 0.40 | IV | Bad seeing. |
| .564 | 19.3 | 357.1 | 0.38 | IV | |
| .578 | 17.5 | 357.1 | 0.43 | IV | Superb seeing. |
| 1895.471 | 17.8 | 339.5 | 0.42 | IV | Well separated. Good. |
| .567 | 16.9 | 342.1 | 0.43 | IV | Good. |
| .581 | 18.6 | 341.6 | 0.44 | IV | Good. |

7—OB.

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Ocular. | Remarks. |
|-------|----------|----------|-----------|---------|----------|
| | <i>h</i> | <i>o</i> | <i>''</i> | | |

Ad. Σ 2091. (DEMBOWSKI) — Continued.

| | | | | | |
|----------|------------|--------|------|-------|------------------------------|
| 1896.416 | 14.6 | 338.8 | 0.49 | IV | Good. |
| .444 | 14.2 | 341.1 | 0.36 | IV | Separated. 0'.40 <i>est.</i> |
| .647 | 18.6 | 337.1 | 0.42 | IV | Good. |
| 1892.561 | 8 <i>n</i> | 355.77 | 0.40 | Mean. | |
| 95.540 | 8 <i>n</i> | 341.07 | 0.43 | | |
| 96.502 | 2 <i>n</i> | 339.00 | 0.42 | | |

 Σ 2106.

R. A., 16h 45m.2

Dec., +9° 37'

| | | | | | |
|----------|------------|-----------|------------------|--------|-----------------|
| 1895.551 | 16.7 | Elongated | in 130° | .... | Very blurred. |
| .567 | 17.2 | 308.4 | 0.37 | IV | |
| .575 | 16.7 | Elongated | in 310° | IV | |
| .581 | 16.7 | 312.3 | 0.25 <i>est.</i> | IV | |
| .610 | 17.1 | 318.4 | 0.37 | IV | Well separated. |
| 1896.586 | 17.5 | 304.6 | 0.25 <i>est.</i> | IV | Cuneiform. |
| .647 | 19.0 | 304.6 | 0.41 | IV | Difficult. |
| .655 | 19.2 | 302.5 | 0.35 <i>est.</i> | IV | |
| 1895.586 | 8 <i>n</i> | 311.37 | 0.32 | Means. | |
| 96.629 | 8 <i>n</i> | 308.90 | 0.31 | | |

 Σ 2107.

R. A., 16h 46m.9

Dec., +28° 51'

| | | | | | |
|----------|------|-------|------|----|-----------------------|
| 1892.578 | 17.9 | 279.5 | 0.48 | IV | |
| .583 | 19.0 | ..... | .... | IV | Cannot separate. |
| .594 | 17.8 | 279.0 | 0.40 | IV | |
| .610 | 17.0 | 280.8 | 0.42 | IV | |
| .613 | 17.8 | 281.6 | 0.47 | IV | Seeing not very good. |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Ocular. | Remarks. |
|-------|----------|----------|----------|---------|----------|
| | <i>h</i> | <i>o</i> | <i>r</i> | | |

Σ 2107 — Continued.

| | | | | | |
|----------|------------|--------|------------------|--------|------------------|
| 1895.567 | 17.3 | 288.4 | 0.87 | IV | Cannot separate. |
| .575 | .... | ..... | .... | IV | |
| .581 | 18.4 | 295.1 | 0.80 <i>est.</i> | IV | |
| .610 | 17.2 | 289.3 | 0.86 | IV | Separated. |
| 1896.586 | 17.7 | 296.7 | 0.83 <i>est.</i> | IV | |
| .647 | 18.8 | 296.3 | 0.41 | IV | |
| .655 | 19.3 | 299.7 | 0.38 | IV | |
| 1892.599 | 4 <i>n</i> | 280.22 | 0.44 | Means. | |
| 95.596 | 8 <i>n</i> | 290.98 | 0.38 | | |
| 96.629 | 3 <i>n</i> | 297.57 | 0.36 | | |

Σ 2114.

R. A., 16^h 56^m.2

Dec., +8° 37'

| | | | | | |
|----------|------------|--------|------|--------|------------------|
| 1895.476 | 17.5 | 159.0 | 1.28 | IV | 7-9 mag. |
| .551 | 16.9 | 159.7 | 1.28 | IV | |
| .567 | 17.6 | 161.8 | 1.27 | IV | |
| 1896.575 | 18.2 | 161.8 | 1.28 | IV | Good definition. |
| .586 | 17.8 | 161.0 | 1.20 | IV | Good. |
| .589 | 17.1 | 159.4 | 1.33 | IV | |
| 1895.581 | 8 <i>n</i> | 160.17 | 1.28 | Means. | |
| 96.583 | 3 <i>n</i> | 160.73 | 1.27 | | |

| Date. | Sid. T. | p | s | Ocular. | Remarks. |
|-------|---------|-----|-----|---------|----------|
| | h | o | ' | | |

 Σ 2120.

R. A , 16h 59m.7

Dec., +28° 16'

| | | | | | |
|----------|------|--------|------|--------|-------------|
| 1893.553 | 19.7 | 246.5 | 6.68 | IV | Good. |
| .597 | 19.0 | 245.1 | 6.66 | IV | |
| .630 | 19.8 | 245.1 | 6.66 | III | |
| 1895.476 | 17.8 | 245.1 | 7.06 | IV | Bad seeing. |
| .567 | 19.3 | 245.9 | 6.95 | III | |
| 1892.503 | 8 n | 245.57 | 6.67 | Means. | |
| 95.522 | 2 n | 245.50 | 7.00 | | |

 μ DRACONIS. Σ 2130.

R. A., 17h 2m.9

Dec., +54° 38'

| | | | | | |
|----------|------|--------|------|--------|---------------|
| 1892.681 | 19.0 | 154.8 | 2.44 | IV | Good obs. |
| .709 | 22.9 | 154.8 | 2.49 | III | |
| .769 | 18.2 | 156.8 | 2.26 | III | |
| 1898.840 | 19.4 | 152.1 | 2.37 | IV | Very blurred. |
| .845 | 20.7 | 154.4 | 2.43 | IV | |
| 1895.507 | 18.9 | 153.8 | 2.47 | III | |
| .581 | 19.2 | 152.6 | 2.34 | III | Good. |
| .832 | 19.7 | 152.7 | 2.41 | III | |
| 1896.411 | 14.2 | 152.7 | 2.28 | III | |
| .416 | 15.2 | 152.0 | 2.41 | III | |
| .444 | 14.4 | 152.0 | 2.35 | III | |
| 1892.720 | 8 n | 155.47 | 2.40 | Means. | |
| 98.842 | 2 n | 153.25 | 2.40 | | |
| 95.660 | 8 n | 153.03 | 2.41 | | |
| 96.424 | 8 n | 152.28 | 2.35 | | |

| Date. | Sid T. | p | s | Ocular. | Remarks. |
|-------|--------|-----|-----|---------|----------|
| | h | . | . | | |

Lac. 7215. β 416.

R. A., 17h 10m.8

Dec., $-84^{\circ} 51'$

| | | | | | |
|----------|------|-------|-----------------------|-----|-----------------------------------|
| 1895.581 | 16.8 | 819.6 | 0.91 | III | Too blurred for distance measure. |
| .622 | 17.2 | 823.8 | .... | V | |
| 1896.602 | 17.7 | 814.9 | 1.26 | III | |
| | | | $\frac{1}{2}(A+B), C$ | | |
| 1895.581 | 16.9 | 180.1 | 80.50 | III | |

 Σ 2173.

R. A., 17h 24m.2

Dec., $-0^{\circ} 56'$

| | | | | | |
|----------|---------|--------|------|--------|---------------------------------------|
| 1892.487 | 16.0 | 159.0 | 0.78 | IV | Bad seeing. Distance especially poor. |
| .542 | 19.5 | 164.8 | 1.08 | IV | |
| .553 | 19.9 | 160.0 | 0.89 | IV | |
| .564 | 18.4 | 163.5 | 0.91 | IV | Good. |
| 1895.551 | 17.2 | 159.0 | 1.19 | IV | Good. |
| .567 | 17.7 | 158.0 | 1.20 | IV | |
| .581 | 17.1 | 156.0 | 1.01 | IV | Good. |
| 1896.536 | 18.8 | 155.8 | 1.11 | IV | Good. |
| .589 | 17.8 | 156.4 | 0.81 | IV | |
| .602 | 17.8 | 155.2 | 1.05 | IV | |
| 1892.536 | 4 π | 161.82 | 0.90 | Means. | |
| 95.536 | 8 π | 157.67 | 1.13 | | |
| 96.592 | 8 π | 155.63 | 0.99 | | |

OBSERVATIONS OF DOUBLE STARS.

| Date. | Sid. T. | p | s | Ocular. | Remarks. |
|-------|---------|-----|-----|---------|----------|
| | h | . | . | | |

 Σ 2220. μ HERCULIS. B. C.

R. A., 17h 41m.8

Dec., +27° 48'

| | | | | | |
|----------|------|-------|------|--------|----------------------------|
| 1892.542 | 18.1 | 32.3 | 0.72 | IV | |
| .578 | 18.2 | 24.0 | 0.95 | IV | Stars faint and difficult. |
| .583 | 19.3 | 31.6 | 0.91 | IV | |
| .618 | 17.4 | 28.6 | 0.73 | III | Good. |
| 1894.739 | 20.3 | 48.6 | 1.16 | IV | |
| .780 | 19.9 | 40.1 | 1.14 | III | Faint and difficult. |
| .782 | 19.7 | 41.1 | 1.19 | IV | |
| 1895.586 | 17.5 | 42.4 | 1.21 | IV | |
| .608 | 17.2 | 44.1 | 1.04 | III | Good. |
| .622 | 17.7 | 46.6 | 1.23 | III | |
| 1896.647 | 19.3 | 48.3 | 1.32 | IV | Good. |
| .655 | 19.6 | 48.8 | 1.42 | IV | |
| 1892.554 | 4 n | 29.12 | 0.83 | Means. | |
| 94.767 | 3 n | 41.60 | 1.16 | | |
| 95.605 | 3 n | 44.37 | 1.16 | | |
| 96.651 | 2 n | 48.55 | 1.37 | | |

 Ω 338.

R. A., 17h 46m.5

Dec., +15° 21'

| | | | | | |
|----------|------|-------|------|----|-------------------------|
| 1893.725 | 20.0 | 200.4 | 0.62 | IV | Blurred. |
| 1894.739 | 20.5 | 199.3 | 0.59 | IV | |
| .780 | 19.6 | 18.7 | 0.58 | IV | Fair seeing. Mag. 8-8.1 |
| .782 | 19.9 | 20.3 | 0.64 | IV | 8-8.1 |
| 1895.586 | 17.6 | 193.7 | 0.62 | IV | |
| .608 | 17.4 | 14.4 | 0.61 | IV | |
| .622 | 17.4 | 16.5 | 0.58 | IV | |

| Date. | Sid. T. | p | s | Ocular. | Remarks. |
|-------|---------|------------|-----|---------|----------|
| | h | $^{\circ}$ | $'$ | | |

O Σ 338 — Continued.

| | | | | | |
|----------|-------|-------|------|-------|--|
| 1896.589 | 17.5 | 17.4 | 0.58 | IV | |
| .644 | 17.9 | 195.1 | 0.59 | IV | |
| 1898.725 | 1 n | 20.40 | 0.62 | Means | |
| 94.767 | 3 n | 19.43 | 0.60 | | |
| 95.605 | 3 n | 14.87 | 0.60 | | |
| 96.616 | 2 n | 16.25 | 0.58 | | |

O Σ 338. $\frac{1}{2}$ (A+B), C.

| | | | | | |
|----------|------|-------|-------|----|-----------------------------|
| 1894.739 | 20.7 | 216.7 | 27.97 | IV |13 mag. Very difficult. |
|----------|------|-------|-------|----|-----------------------------|

 Σ 2262. τ OPHIUCHI.R. A., 17^h 56^m.4

Dec., -8° 11'

| | | | | | |
|----------|-------|--------|------|--------|--------------|
| 1892.564 | 18.8 | 256.8 | 1.82 | IV | |
| .567 | 19.6 | 252.8 | 1.60 | IV | |
| .583 | 19.5 | 254.4 | 2.00 | IV | Blazing. |
| .597 | 18.4 | 254.2 | 1.71 | IV | |
| 1894.744 | 18.9 | 254.1 | 1.70 | IV | |
| .780 | 19.8 | 253.3 | 1.63 | IV | |
| .782 | 19.2 | 256.6 | 1.59 | IV | Good seeing. |
| 1892.578 | 4 n | 254.55 | 1.78 | Means. | |
| 94.769 | 8 n | 254.67 | 1.64 | | |

 Σ 2275.R. A., 17^h 59^m.3

Dec., +39° 21'

| | | | | | |
|----------|------|-------|------|-----|----------|
| 1892.769 | 21.9 | 817.0 | 0.62 | III | |
| .788 | 21.7 | 813.5 | 0.78 | IV | Good obs |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Ocular. | Remarks. |
|-------|----------|----------|----------|---------|----------|
| | <i>h</i> | <i>o</i> | <i>'</i> | | |

Σ 2275 — Continued.

| | | | | | |
|----------|------|--------|------|--------|----------------------|
| 1894.786 | 20.9 | 815.7 | 0.70 | IV | 9.7—10 mag. |
| 1895.622 | 18.1 | ..... | .... | .... | Single? |
| .744 | 20.0 | ..... | .... | .... | Doubtful elongation. |
| .758 | 21.7 | 815.1 | 0.69 | IV | |
| .832 | 20.0 | 814.5 | 0.68 | III | Good. |
| .856 | 20.6 | 818.0 | 0.72 | IV | Good. |
| 1892.778 | 2 n | 815.25 | 0.70 | Means. | |
| 94.786 | 1 n | 815.70 | 0.70 | | |
| 95.715 | 8 n | 815.87 | 0.68 | | |

Σ 2272. 70 OPHIUCHI.

R. A., 17h 59m.4

Dec., +2° 32'

| | | | | | |
|----------|------|-------|------|-----|---------------------|
| 1893.551 | 18.4 | 822.7 | 2.26 | IV | VI Inch. |
| .567 | 19.9 | 818.7 | 2.27 | IV | |
| .570 | 16.1 | 822.5 | 2.17 | IV | |
| .597 | 18.7 | 821.2 | 2.08 | IV | |
| 1893.564 | 18.7 | 812.6 | 2.86 | IV | |
| .570 | 17.6 | 811.7 | 2.85 | IV | |
| .575 | 17.7 | 814.6 | 2.42 | IV | Badly blurred. |
| .581 | 16.7 | 815.9 | 2.28 | IV | |
| .802 | 19.4 | 808.5 | 2.81 | IV | |
| 1894.789 | 21.0 | 801.6 | 2.32 | IV | Blurred. |
| .744 | 18.4 | 808.5 | 2.28 | IV | |
| .750 | 18.5 | 801.1 | 2.25 | III | Rather poor seeing. |
| .760 | 18.2 | 808.7 | 2.86 | IV | X inch. |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Ocular. | Remarks. |
|-------|----------|----------|----------|---------|----------|
| | <i>h</i> | <i>o</i> | <i>r</i> | | |

70 OPHIUCHI — Continued.

| | | | | | |
|----------|------------|--------|------|--------|-----------------------|
| 1895.586 | 17.8 | 297.3 | 2.15 | IV | Good. |
| .608 | 17.7 | 296.4 | 2.18 | III | |
| .622 | 18.0 | 295.8 | 2.29 | III | |
| 1896.589 | 17.8 | 289.2 | 2.24 | IV | |
| .644 | 17.7 | 286.5 | 2.18 | IV | Blurred and unsteady. |
| .647 | 20.2 | 287.6 | 2.29 | IV | |
| .652 | 17.5 | 287.6 | 2.23 | III | |
| 1892.571 | 4 <i>n</i> | 321.28 | 2.20 | Means. | |
| 98.618 | 5 <i>n</i> | 312.66 | 2.34 | | |
| 94.748 | 4 <i>n</i> | 302.48 | 2.30 | | |
| 95.605 | 3 <i>n</i> | 296.50 | 2.19 | | |
| 96.633 | 4 <i>n</i> | 287.72 | 2.22 | | |

O Σ 342. 72 OPHIUCHI.R. A., 18^h 1^m.6

Dec., +9° 33'

| | | | | | |
|----------|------|-------|------|----|---------------------|
| 1892.788 | 18.7 | ..... | .... | IV | Round. Fine seeing. |
| 1893.802 | 19.5 | ..... | .... | IV | Cannot separate. |

O. Struve questions the existence of a satellite.

99 HERCULIS.

R. A., 18^h 2^m.5

Dec., +30° 33'

| | | | | | |
|----------|------|-------|------|-----|-------------|
| 1894.736 | 20.4 | 305.7 | 0.88 | IV | 6.—10. mag. |
| 1895.744 | 20.8 | 311.1 | 0.93 | IV | Blurred. |
| .813 | 19.8 | 306.0 | 1.08 | IV | Good. |
| .856 | 20.2 | 311.7 | 1.00 | III | Good. |

8—OB.

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Ocular. | Remarks. |
|-------|----------|----------|----------|---------|----------|
| | <i>h</i> | <i>o</i> | <i>'</i> | | |

99 HERCULIS—Continued.

| | | | | | |
|----------|------------|--------|------|--------|----------------------|
| 1898.647 | 19.7 | 318.7 | 1.09 | IV | |
| .655 | 18.8 | 312.7 | 1.11 | IV | Difficult but good. |
| .657 | 18.1 | 309.4 | 1.01 | IV | Faint and difficult. |
| 1894.736 | 1 <i>n</i> | 305.70 | 0.88 | Means. | |
| 95.804 | 8 <i>n</i> | 309.60 | 1.00 | | |
| 96.658 | 8 <i>n</i> | 311.93 | 1.07 | | |

Σ 2281, 73 OPHIUCHI.

R. A., 18^h 3^m 2

Dec., +8° 57'

| | | | | | |
|----------|------------|--------|------------------|--------|-----------------|
| 1898.802 | 19.8 | 238.2 | 0.40 | IV | |
| 1894.782 | 19.5 | 243.1 | 0.45 | IV | |
| 1895.747 | 18 5 | 234.4 | 0.80 | IV | |
| .753 | 18.6 | 235.4 | 0.83 | IV | Good. |
| .777 | 19.0 | 238.8 | 0.30 <i>est.</i> | IV | Very blurred. |
| .813 | 20.0 | 235.0 | 0.44 | IV | Well separated. |
| 1896.586 | 18.6 | 235.0 | 0.35 <i>est.</i> | IV | Blurred. |
| .647 | 20.0 | 235.5 | 0.35 <i>est.</i> | IV | Not separated. |
| .655 | 18.6 | 232.6 | 0.41 | IV | Well separated. |
| 1894.295 | 2 <i>n</i> | 240.65 | 0.42 | Means. | |
| 95.772 | 4 <i>n</i> | 235.90 | 0.33 | | |
| 96.629 | 8 <i>n</i> | 234.87 | 0.35 | | |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Ocular. | Remarks. |
|-------|----------|----------|----------|---------|----------|
| | <i>h</i> | <i>°</i> | <i>'</i> | | |

Σ 2315.

R. A., 18h 20m.2

Dec., +27° 18'

| | | | | | |
|----------|------------|---------------|------------------|--------|-----------------------|
| 1894.736 | 20.5 | Suspect elong | gation in 190° | | |
| 1895.610 | 20.0 | Elongated | in 200° | | |
| .744 | .... | .... | .... | .... | Single. |
| .747 | 18.7 | 218.1 | 0.25 <i>est.</i> | IV | |
| .818 | 19.7 | 217.4 | 0.25 <i>est.</i> | IV | Elongated. |
| .856 | 20.4 | 213.6 | 0.25 <i>est.</i> | IV | |
| 1896.655 | 20.1 | 210.7 | 0.25 <i>est.</i> | IV | Cuneiform. Difficult. |
| 1895.805 | 8 <i>n</i> | 216.87 | 0.21 | Means. | |
| 96.655 | 1 <i>n</i> | 210.70 | 0.21 | | |

OΣ 353, φ DRACONIS.

R. A., 18h 22m.9

Dec., +71° 16'

| | | | | | |
|----------|------------|---------------|------------------|--------|-----------------------|
| 1893.840 | 19.7 | 230.6 | 0.34 | IV | Well separated. Good. |
| 1895.581 | 18.4 | Suspect comes | in 320° | | |
| .780 | 19.8 | 221.4 | 0.35 <i>est.</i> | IV | Blurred. |
| .856 | 21.2 | 223.8 | 0.42 | IV | Difficult. |
| 1896.681 | 19.3 | 222.6 | 0.55 | IV | |
| 1893.840 | 1 <i>n</i> | 230.60 | 0.34 | Means. | |
| 95.818 | 2 <i>n</i> | 223.85 | 0.37 | | |
| 96.681 | 1 <i>n</i> | 222.60 | 0.55 | | |

OΣ 357.

R. A., 18h 30m.4

Dec., +11° 37'

| | | | | | |
|----------|------------|--------|------|-------|-------------------|
| 1892.788 | 21.3 | 69.7 | 0.32 | IV | |
| 1894.736 | 20.2 | 251.5 | 0.39 | IV | 8-8.5 <i>mag.</i> |
| 1895.610 | 20.2 | 248.8 | 0.36 | IV | Notched. |
| .623 | 18.8 | 251.6 | 0.37 | IV | |
| 1894.689 | 4 <i>n</i> | 250.40 | 0.36 | Mean. | |

OBSERVATIONS OF DOUBLE STARS.

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Ocular. | Remarks. |
|-------|----------|----------|----------|---------|----------|
| | <i>h</i> | <i>o</i> | <i>'</i> | | |

 Σ 2384.R. A., 18^h 38^m.6

Dec., +67° 1'

| | | | | | |
|----------|------------|--------|------|--------|--|
| 1892.769 | 21.4 | 304.5 | 0.43 | IV | |
| .788 | 21.9 | 307.6 | 0.49 | IV | |
| 1895.581 | 19.0 | 182.9 | 0.50 | IV | |
| .758 | 20.9 | 307.8 | 0.43 | IV | |
| .758 | 22.0 | 306.7 | 0.50 | IV | |
| 1892.778 | 2 <i>n</i> | 306.05 | 0.46 | Means. | |
| 95.697 | 3 <i>n</i> | 309.13 | 0.48 | | |

 $O\Sigma$ 363.R. A., 18^h 43^m.8

Dec., +77° 35'

| | | | | | |
|----------|------------|-------|------------------|--------|----------------|
| 1893.840 | 19.9 | 199.8 | 0.80 <i>est.</i> | IV | |
| 1895.780 | 19.9 | 17.8 | 0.80 <i>est.</i> | IV | Elongated. |
| .856 | 21.4 | 25.7 | 0.25 <i>est.</i> | IV | Blurred. |
| 1896.681 | 19.5 | 24.6 | 0.40 | IV | Not separated. |
| 1893.840 | 1 <i>n</i> | 19.80 | 0.26 | Means. | |
| 95.818 | 2 <i>n</i> | 21.75 | 0.24 | | |
| 96.681 | 1 <i>n</i> | 24.60 | 0.40 | | |

 Σ 2400. AB.R. A., 18^h 43^m.5

Dec., +16° 9'

| | | | | | |
|----------|------|-------|------|----|------------------|
| 1894.786 | 19.8 | 185.7 | 1.81 | IV | Good definition. |
|----------|------|-------|------|----|------------------|

 Σ 2400. BC.

| | | | | | |
|----------|------|-------|------|----|-------------------|
| 1894.786 | 19.9 | 198.1 | 0.79 | IV | 11-11 <i>mag.</i> |
|----------|------|-------|------|----|-------------------|

| Date. | Sid T. | <i>p</i> | <i>s</i> | Ocular. | Remarks. |
|-------|----------|----------|----------|---------|----------|
| | <i>h</i> | <i>°</i> | <i>'</i> | | |

Σ 2452.

R. A., 18h 57m.2

Dec., +75° 38'

| | | | | | |
|----------|------|--------|------|-------|--------------|
| 1893.848 | 0.8 | 219.6 | 5.71 | IV | 6.5 7.5 mag. |
| 1894.268 | 9.8 | 217.8 | 5.58 | III | 6. 7. |
| 1895.695 | 23.5 | 218.2 | 5.75 | III | |
| .709 | 19.2 | 220.0 | 5.64 | III | |
| .753 | 21.2 | 217.4 | 5.59 | III | |
| .769 | 20.7 | 219.0 | 5.83 | III | |
| .777 | 23.2 | 217.9 | 5.75 | VI | |
| .791 | 22.2 | 217.7 | 5.59 | III | Good. |
| 1895.325 | 8 n | 218.45 | 5.68 | Mean. | |

Σ 2454.

R. A., 19h 1m.5

Dec., +80° 15'

| | | | | | |
|----------|------|--------|------|-------|--|
| 1893.791 | 21.1 | 239.2 | 0.71 | IV | |
| .810 | 20.9 | 244.9 | 0.70 | IV | |
| 1894.782 | 20.8 | 240.5 | 0.66 | IV | |
| 1894.129 | 3 n | 241.58 | 0.69 | Mean. | |

Σ 2455.

R. A., 19h 1m.8

Dec., +21° 58'

| | | | | | |
|----------|------|-------|------|--------|------------------|
| 1893.785 | 21.3 | 87.2 | 3.42 | IV | |
| .791 | 21.3 | 85.7 | 3.42 | IV | |
| .804 | 21.6 | 83.9 | 3.23 | III | Very bad seeing. |
| .810 | 21.1 | 85.5 | 3.88 | IV | |
| 1894.739 | 21.3 | 86.5 | 3.24 | III | |
| .782 | 20.5 | 86.9 | 3.47 | III | |
| 1893.798 | 4 n | 85.58 | 3.36 | Means. | |
| 94.760 | 2 n | 86.70 | 3.36 | | |

OBSERVATIONS OF DOUBLE STARS.

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Ocular. | Remarks. |
|-------|---------|----------|----------|---------|----------|
| | h | ° | ' | | |

Σ 2465.

R. A., 19h 3m.1

Dec., +80° 30'

| | | | | | |
|----------|------|-------|------|----|-------|
| 1898.785 | 20.9 | 250.2 | 1.04 | IV | Good. |
|----------|------|-------|------|----|-------|

Σ 2525. 22 CYGNI B.

R. A., 19h 21m.7

Dec., +27° 8'

| | | | | | |
|----------|------|--------|------------------|--------|---------------------------------------|
| 1898.785 | 21.6 | 332.1 | 0.34 | IV | Images not entirely separated. |
| .791 | 21.7 | 330.5 | 0.32 | IV | Ditto. |
| .824 | 21.7 | 326.2 | 0.30 <i>est.</i> | IV | Cuneiform. |
| 1894.783 | 21.0 | 330. | 0.35 <i>est.</i> | IV | Both <i>p</i> and <i>s</i> estimated. |
| 1895.610 | 19.8 | 327.4 | 0.42 | IV | |
| .675 | 19.5 | 329.0 | 0.30 <i>est.</i> | IV | Notched. |
| .744 | 20.6 | 325.5 | 0.45 | IV | Blurred; not well separated. |
| 1896.655 | 20.3 | 324.3 | 0.42 | IV | Separated. |
| .657 | 18.8 | 327.5 | 0.40 | IV | |
| .666 | 19.4 | 327.4 | 0.42 | IV | |
| 1898.800 | 3 n | 329.60 | 0.31 | Means. | |
| 95.676 | 3 n | 327.30 | 0.38 | | |
| 96.659 | 3 n | 326.40 | 0.41 | | |

Σ 2579. δ CYGNI.

R. A., 19h 41m.2

Dec., +44° 56'

| | | | | | |
|----------|------|-------|------|-----|------------------|
| 1892.570 | 16.4 | 314.2 | 1.60 | IV | |
| .594 | 12.0 | 307.7 | 1.55 | IV | |
| .709 | 22.2 | 310.2 | 1.44 | III | |
| 1893.796 | 19.2 | 311.1 | 1.78 | IV | Very bad seeing. |
| 1894.744 | 18.7 | 313.5 | 1.59 | IV | Good. |

| Date. | Sid. T. | p | s | Ocular. | Remarks. |
|-------|---------|-----|-----|---------|----------|
| | h | o | o | | |

Σ 2579. δ CYGNI — Continued.

| | | | | | |
|----------|------|--------|------|--------|---------------|
| 1895.777 | 18.2 | 309.0 | 1.48 | IV | Unsteady. |
| .856 | 20.8 | 304.3 | 1.67 | IV | Good. |
| 1896.416 | 15.4 | 305.6 | 1.72 | IV | |
| .652 | 18.2 | 307.6 | 1.94 | IV | Very blurred. |
| .666 | 18.1 | 302.4 | 1.62 | IV | |
| .673 | 18.2 | 304.1 | 1.58 | IV | |
| 1892.624 | 3 n | 310.70 | 1.53 | Means. | |
| 94.270 | 2 n | 312.30 | 1.68 | | |
| 95.816 | 2 n | 306.65 | 1.58 | | |
| 96.602 | 4 n | 304.92 | 1.72 | | |

OΣ 387.

R A., 19^h 44^m.1

Dec., +35° 0'

| | | | | | |
|----------|------|-------|------|----|-------|
| 1892.578 | 18.6 | 354.2 | 0.61 | IV | |
| .594 | 19.6 | 353.9 | 0.49 | IV | |
| .613 | 18.7 | 350.7 | 0.63 | IV | |
| .709 | 22.4 | 353.2 | 0.55 | IV | |
| 1893.785 | 21.6 | 347.2 | 0.55 | IV | |
| .791 | 21.9 | 348.9 | 0.50 | IV | |
| .824 | 21.9 | 347.9 | 0.51 | IV | |
| 1895.675 | 18.8 | 347.2 | 0.49 | IV | |
| .744 | 20.8 | 345.3 | 0.61 | IV | |
| .747 | 19.1 | 347.6 | 0.56 | IV | |
| 1896.655 | 20.5 | 343.8 | 0.63 | IV | |
| .657 | 18.5 | 342.2 | 0.57 | IV | |
| .666 | 18.9 | 344.5 | 0.57 | IV | Good. |

| Date. | Sid. T. | p | s | Ocular. | Remarks. |
|-------|---------|-----|-----|---------|----------|
| | h | o | ' | | |

O Σ 387 — Continued.

| | | | | | |
|----------|-----|--------|------|--------|--|
| 1892.624 | 4 n | 853.00 | 0.57 | Means. | |
| 93.800 | 3 n | 848.00 | 0.52 | | |
| 95.722 | 3 n | 846.70 | 0.55 | | |
| 96.659 | 3 n | 843.50 | 0.59 | | |

 Σ 2603. ϵ DRACONIS.R. A., 19^h 48^m.6

Dec., +69° 57'

| | | | | | |
|----------|------|--------|------|-------|------------------------|
| 1893.843 | 1.2 | 859.7 | 3.01 | IV | |
| .882 | 23.0 | 863.9 | 2.84 | IV | |
| 1894.782 | 21.2 | 858.5 | 3.20 | III | Very bad seeing. |
| 1895.709 | 19.4 | 866.4 | 2.99 | III | Blurred and difficult. |
| .769 | 20.9 | 863.8 | 3.07 | III | Blurred. |
| .777 | 23.7 | 863.0 | 3.27 | V | |
| .791 | 22.4 | 861.7 | 3.18 | III | |
| .862 | 21.6 | 864.0 | 2.92 | III | Good. |
| 1895.177 | 8 n | 862.50 | 3.06 | Mean. | |

O Σ 400.R. A., 20^h 6^m.2

Dec., +48° 36'

| | | | | | |
|----------|------|---------------|----------------|------------|-----------------------------|
| 1892.788 | 22.2 | Slightly elon | gated in $p =$ | 300°. Dist | ance does not exceed 0".20. |
| 1893.785 | 22.0 | ..... | .... | .... | Cannot separate. |
| .791 | 22.0 | ..... | .... | .... | Cannot separate. |
| 1895.758 | 22.2 | .... | .... | .... | Round. Good definition. |
| 1896.666 | 18.2 | ..... | .... | .... | Single. |

| Date. | Sid. T. | p | s | Ocular. | Remarks. |
|-------|---------|------------|-----|---------|----------|
| | h | $^{\circ}$ | $'$ | | |

 Σ 2675. κ CEPHEI.R. A., 20^h 13^m.1

Dec., +77° 19'

| | | | | | |
|----------|-------|--------|------|-------|--------------------------------------|
| 1893.879 | 23.1 | 125.8 | 7.59 | IV | Thro' wire screen. Seeing very poor. |
| .882 | 23.2 | 123.5 | 7.24 | IV | |
| 1894.268 | 10.2 | 124.1 | 7.39 | III | Very blurred. |
| 1895.709 | 19.7 | 121.0 | 7.40 | III | |
| .769 | 21.1 | 124.1 | 7.31 | III | Blurred. |
| .777 | 0.0 | 125.0 | 7.22 | V | |
| .791 | 22.7 | 123.6 | 7.34 | III | Good. |
| .862 | 21.9 | 124.5 | 7.30 | III | |
| 1895.116 | 8 n | 123.95 | 7.35 | Mean. | |

 β 151. β DELPHINI.R. A., 20^h 31^m.8

Dec., +14° 11'

| | | | | | |
|----------|-------|--------|------|--------|---------------|
| 1893.785 | 22.3 | 342.8 | 0.56 | IV | Blurred. |
| .788 | 19.5 | 346.1 | 0.49 | IV | Poor seeing. |
| .791 | 22.5 | 351.6 | 0.47 | IX | X inch. |
| 1895.610 | 20.3 | 350.6 | 0.61 | IV | Very blurred. |
| .675 | 19.7 | 350.8 | 0.51 | IV | |
| .692 | 19.1 | 351.0 | 0.62 | IV | |
| 1896.655 | 21.0 | 356.1 | 0.64 | IV | |
| .666 | 19.6 | 353.6 | 0.55 | IV | |
| .673 | 18.8 | 352.4 | 0.57 | IV | |
| 1893.788 | 8 n | 346.83 | 0.51 | Means. | |
| 95.659 | 8 n | 350.80 | 0.58 | | |
| 96.665 | 8 n | 354.03 | 0.59 | | |

9—OB.

OBSERVATIONS OF DOUBLE STARS.

| Date. | Sid. T. | p | s | Ocular. | Remarks. |
|-------|---------|-----|-----|---------|----------|
| | h | o | . | | |

O Σ 413. λ CYGNI.

R. A., 20h 42m.6

Dec., +36° 4'

| | | | | | |
|----------|------|-------|------|--------|-------------------------|
| 1892.578 | 18.8 | 73.3 | 0.77 | IV | |
| .594 | 19.7 | 65.1 | 0.66 | IV | |
| .725 | 22.3 | 68.8 | 0.51 | IV | Blurred and difficult. |
| 1893.785 | 22.5 | 65.1 | 0.64 | IV | Blurred. |
| .791 | 22.2 | 68.7 | 0.52 | IV | |
| .824 | 22.1 | 65.2 | 0.61 | IV | |
| 1895.675 | 19.1 | 71.5 | 0.67 | IV | Blurred. |
| .692 | 19.3 | 80.4 | 0.45 | IV | Very blurred. Poor obs. |
| .747 | 18.9 | 70.1 | 0.58 | IV | |
| 1896.644 | 19.0 | 71.8 | 0.56 | IV | |
| .655 | 20.7 | 68.1 | 0.70 | IV | |
| .666 | 19.2 | 70.3 | 0.66 | IV | |
| 1892.682 | 3 n | 69.07 | 0.65 | Means. | |
| 93.800 | 3 n | 66.33 | 0.59 | | |
| 95.705 | 3 n | 74.00 | 0.57 | | |
| 96.655 | 3 n | 70.07 | 0.64 | | |

 Σ 2729. 4 AQUARI.

R. A., 20h 45m.0

Dec., -6° 4'

| | | | | | |
|----------|------|-------|-----------|----|----------------|
| 1892.788 | 19.3 | 176.9 | 0.88 | IV | Good. |
| .826 | 22.2 | 186.6 | .... | IV | Not separated. |
| 1893.799 | 20.6 | 183.9 | .... | IV | Elongated. |
| .824 | 22.4 | 180.8 | 0.85 est. | IV | Difficult. |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Ocular. | Remarks. |
|-------|----------|----------|----------|---------|----------|
| | <i>h</i> | <i>o</i> | <i>'</i> | | |

4 AQUARI — Continued.

| | | | | | |
|----------|------------|--------|------------------|--------|------------|
| 1895.610 | 19.5 | 193.9 | 0.30 <i>est.</i> | IV | Elongated. |
| .744 | 21.1 | 196.3 | 0.25 <i>est.</i> | IV | Elongated. |
| .813 | 20.2 | 186.8 | 0.35 <i>est.</i> | IV | Elongated. |
| .824 | 21.6 | 196.6 | 0.25 <i>est.</i> | IV | Notched. |
| 1896.655 | 21.1 | 198.2 | 0.30 <i>est.</i> | IV | Cuneiform. |
| .681 | 20.1 | 190.1 | 0.25 <i>est.</i> | IV | Elongated. |
| 1892.907 | 2-1 | 181.75 | 0.33 | Means. | |
| 93.812 | 2-1 | 182.35 | 0.32 | | |
| 95.764 | 4 <i>n</i> | 193.90 | 0.22 | | |
| 96.668 | 1 <i>n</i> | 194.15 | 0.24 | | |

Σ 2737. ε EQUULEI. A B.

R. A., 20h 53m.1

Dec., +3° 50'

| | | | | | |
|----------|------|--------|------|--------|-------------------|
| 1893.788 | 20.9 | 103.7 | 0.63 | IV | Bad images. |
| .791 | 22.9 | 287.2 | 0.63 | IV | |
| .799 | 20.7 | 286.0 | 0.66 | IV | Seeing very poor. |
| 1894.780 | 21.5 | 285.1 | 0.66 | IV | |
| 1895.610 | 19.7 | 284.2 | 0.77 | IV | |
| .675 | 19.8 | 284.5 | 0.69 | IV | |
| .744 | 21.2 | 285.1 | 0.79 | IV | |
| 1896.665 | 21.3 | 284.2 | 0.73 | IV | |
| .666 | 20.3 | 284.0 | 0.80 | IV | |
| 1893.793 | 3 n | 285.63 | 0.64 | Means. | |
| 94.780 | 1 n | 285.10 | 0.66 | | |
| 95.676 | 3 n | 284.60 | 0.75 | | |
| 96.660 | 2 n | 284.10 | 0.76 | | |

OBSERVATIONS OF DOUBLE STARS.

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Ocular. | Remarks. |
|--|------------|----------|----------|---------|----------|
| | h | ° | ' | | |
| Σ 2737. ϵ EQUULEI. $\frac{1}{2}$ (A+B), C. | | | | | |
| 1893.788 ¹ | 21.2 | 73.0 | 10.86 | IV | |
| .791 ¹ | 23.1 | 73.8 | 10.83 | IV | |
| .799 ¹ | 20.9 | 73.4 | 10.77 | IV | |
| 1894.780 | 21.3 | 74.6 | 10.95 | III | |
| 1895.610 | 19.9 | 73.4 | 10.97 | IV | |
| .675 | 20.0 | 72.7 | 10.80 | III | |
| .744 ¹ | 21.2 | 74.6 | 10.92 | IV | |
| 1896.655 ¹ | 21.4 | 74.3 | 10.73 | IV | |
| .666 ¹ | 20.5 | 74.4 | 10.87 | IV | |
| 1893.793 | 3 <i>n</i> | 73.40 | 10.82 | Means. | |
| 94.780 | 1 <i>n</i> | 74.60 | 10.95 | | |
| 95.676 | 3 <i>n</i> | 73.57 | 10.90 | | |
| 96.660 | 2 <i>n</i> | 74.35 | 10.80 | | |

¹ The position angle and distance of AC were measured on these dates and the position angles and distances of $\frac{1}{2}(A+B)$, C given above, were derived from these data by a solution of the triangle ABC.

Σ 2758. 61 CYGNI.

R. A., 21^h 1^m.1

Dec., +88° 7'

| | | | | | |
|----------|------------|--------|-------|--------|-------|
| 1893.882 | 0.1 | 123.4 | 21.46 | III | Good. |
| 1895.692 | 19.8 | 124.1 | 21.71 | III | |
| .753 | 20.4 | 124.0 | 21.46 | III | |
| .777 | 18.5 | 123.6 | 21.55 | I | |
| 1896.644 | 19.2 | 125.5 | 21.72 | V | |
| 1893.882 | 1 <i>n</i> | 123.40 | 21.46 | Means. | |
| 95.741 | 3 <i>n</i> | 123.90 | 21.57 | | |
| 96.644 | 1 <i>n</i> | 125.50 | 21.72 | | |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Ocular. | Remarks. |
|-------|---------|----------|----------|---------|----------|
| | h | ° | ' | | |

O Σ 527.R. A., 21^h 2^m.1

Dec., +4° 40'

| | | | | | |
|----------|------|-------|------|----|--|
| 1892.769 | 22.6 | 286.8 | 0.85 | IV | Distance very uncertain |
| 1893.791 | 23.4 | 281.2 | 0.38 | IV | Difficult. No motion since O Σ . |

O Σ 535. δ EQUULEI.R. A., 21^h 8^m.6

Dec., +9° 31'

| | | | | | |
|----------|------------|--------|------------------|--------|------------------------|
| 1892.769 | 23.0 | 202.2 | 0.36 | IV | Separated by glimpses. |
| .788 | 19.5 | 199.8 | 0.30 | IV | Images in contact. |
| 1893.824 | 22.5 | 17.5 | 0.25 <i>est.</i> | IV | Cuneiform. |
| .854 | 22.7 | 12.3 | 0.20 <i>est.</i> | IV | Elongated. |
| 1895.610 | 20.0 | .... | .... | IV | Single. |
| 1896.681 | 20.3 | 346.8 | 0.20 <i>est.</i> | IV | Elongated. |
| 1892.778 | 2 <i>n</i> | 21.00 | 0.33 | Means. | |
| 93.839 | 2 <i>n</i> | 19.90 | 0.19 | | |
| 95.610 | 1 <i>n</i> | Single | .... |  |  |
| 96.681 | 1 <i>n</i> | 346.80 | 0.16 | | |

 τ CYGNI.R. A., 21^h 10^m.0

Dec., +37° 32'

| | | | | | |
|----------|------|-------|------|----|------------------------|
| 1892.594 | 18.9 | 361.8 | 0.65 | IV | Blazing. |
| .725 | 22.8 | 356.5 | 0.51 | IV | Blurred and difficult. |
| .826 | 20.2 | 357.0 | 0.63 | IV | Blurred. |
| 1895.675 | 20.2 | 336.3 | 0.82 | IV | Difficult. |
| .744 | 21.1 | 333.9 | 0.91 | IV | |
| 1896.666 | 18.3 | 325.4 | 0.78 | IV | |
| .673 | 18.4 | 333.4 | 0.67 | IV | |
| .681 | 18.6 | 334.0 | 0.63 | IV | Blurred. |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Ocular. | Remarks. |
|-------|----------|----------|----------|---------|----------|
| | <i>h</i> | <i>o</i> | <i>r</i> | | |

 τ CYGNI — Continued.

| | | | | | |
|----------|------------|--------|------|--------|------------------------|
| 1892.715 | 3 <i>n</i> | 858.48 | 0.60 | Means. | |
| 95.710 | 2 <i>n</i> | 885.10 | 0.86 | | |
| 96.678 | 3 <i>n</i> | 880.98 | 0.69 | | A very difficult star. |

 Σ 2801.R. A., 21^h 22^m.4

Dec., +79° 50'

| | | | | | |
|----------|------------|--------|------|-------|----------------------------|
| 1893.843 | 0.5 | 274.1 | 1.69 | IV | 7-8.5 mag. |
| .854 | 0.4 | 272.4 | 1.64 | III | |
| .882 | 23.4 | 273.1 | 1.51 | III | 7-8 |
| 1895.818 | 12.3 | 269.5 | 1.93 | III | Blurred. Poor observation. |
| .769 | 21.3 | 273.5 | 1.88 | III | |
| .777 | 0.3 | 272.6 | 1.77 | VI | |
| .791 | 22.8 | 273.0 | 1.84 | III | Very blurred. |
| 1894.891 | 7 <i>n</i> | 272.60 | 1.75 | Mean. | |

 β 989. κ PEGASI. A B.R. A., 21^h 39^m.2

Dec., +25° 7'

| | | | | | |
|----------|------------|--------|------------------|--------|----------------------|
| 1893.799 | 23.0 | 129.9 | .... | IV | Elongated. |
| .854 | 23.9 | 811.1 | 0.25 <i>est.</i> | IV | Elongated. |
| 1895.744 | 21.3 | 105.6 | 0.15 <i>est.</i> | IV | Elongated. Axes 3:2. |
| .758 | 23.3 | 285.9 | 0.15 <i>est.</i> | IV | Elongated. Axes 3:2. |
| .791 | 20.9 | 121.0 | 0.18 <i>est.</i> | IV | Very blurred. |
| .862 | 20.6 | 118.3 | 0.20 <i>est.</i> | IV | Blurred. |
| 1896.681 | 18.8 | .... | .... | IV | Single. |
| 1893.826 | 2-1 | 130.50 | 0.21 | Means. | |
| 95.789 | 4 <i>n</i> | 112.70 | 0.15 | | |
| 96.681 | 1 <i>n</i> | Single | .... |  |  |

| Date. | Sid. T. | p | s | Ocular. | Remarks. |
|---|---------|------------|-------|---------|----------|
| | h | $^{\circ}$ | $'$ | | |
| Σ 2824. κ PEGASI. $\frac{1}{2}(A+B)$, C. | | | | | |
| 1893.854 | 23.0 | 300.2 | 12.26 | IV | |

 β 693.R. A., 21^h 49^m.9

Dec., -7° 33'

| | | | | | |
|----------|-------|-------|-------|--------|--|
| 1893.799 | 22.4 | 46.7 | 1.12 | IV | Method b. Corr. applied to s . Very faint and difficult. 11 mag. Comes almost invisible. Distance is poor. Difficult. Thro' clouds. Difficult. Good. |
| .824 | 22.8 | 45.9 | 1.14 | IV | |
| .854 | 23.2 | 48.9 | 1.16 | III | |
| 1894.739 | 21.7 | 55.5 | 0.89 | IV | |
| 1895.758 | 22.6 | 48.8 | 0.87: | V | |
| .818 | 22.0 | 48.4 | 1.09 | III | |
| .854 | 22.8 | 51.5 | .... | III | |
| .856 | 21.8 | 52.8 | 1.12 | III | |
| 1893.826 | 8 n | 47.17 | 1.14 | Means. | |
| 94.739 | 1 n | 55.50 | 0.89 | | |
| 95.823 | 4-3 | 50.25 | 1.03 | | |

 β 991.R. A., 22^h 9^m.0

Dec., +51° 58'

| | | | | | |
|----------|------|------|------|------|---------|
| 1893.824 | .... | .... | .... | .... | Single. |
| 1893.666 | .... | .... | .... | IV | Single. |

 β 172. 51 AQUARI.R. A., 22^h 17^m.9

Dec., -5° 27'

| | | | | | |
|----------|------|------|------|----|------------------|
| 1893.799 | 22.6 | 8.6 | 0.56 | IV | Fine definition. |
| .824 | 23.1 | 8.8 | 0.61 | IV | |
| .854 | 22.5 | 10.7 | 0.49 | IV | |

| Date. | Sid. T. | p | s | Ocular. | Remarks. |
|-------|---------|-----|-----|---------|----------|
| | h | ° | ' | | |

51 AQUARI — Continued.

| | | | | | |
|----------|------|------|------|-------|---------------|
| 1895.758 | 22.8 | 6.8 | 0.64 | IV | |
| .791 | 21.3 | 5.5 | 0.68 | IV | Good. |
| .804 | 21.5 | 5.4 | 0.70 | IV | Very blurred. |
| .818 | 22.2 | 7.8 | 0.61 | IV | Very blurred. |
| 1893.826 | 3 n | 9.87 | 0.55 | Means | |
| 95.792 | 4 n | 6.25 | 0.66 | | |

Σ 2909. ζ AQUARI

R. A., 22h 23m.6

Dec., -0° 38'

| | | | | | |
|----------|------|--------|------|-------|---------------|
| 1892.622 | 22.4 | 325.0 | 3.25 | III | Blazing. |
| .742 | 23.1 | 324.8 | 3.23 | III | |
| 1893.851 | 20.8 | 144.9 | 2.95 | III | Blazing. |
| .882 | 0.7 | 321.3 | 3.27 | III | Blazing. |
| 1895.747 | 21.0 | 322.2 | 3.36 | III | Very blurred. |
| .780 | 22.5 | 324.0 | 3.11 | IV | Blazing. |
| .793 | 21.0 | 140.2 | 3.14 | III | |
| .840 | 20.6 | 142.0 | 3.20 | III | |
| 1892.782 | 2 n | 324.90 | 3.24 | Means | |
| 93.866 | 2 n | 323.10 | 3.11 | | |
| 95.790 | 4 n | 323.10 | 3.20 | | |

Σ 2924.

R. A., 22h 29m.9

Dec., +69° 17'

| | | | | | |
|----------|------|-------|------|----|------------|
| 1893.848 | 0.8 | 270.6 | 0.67 | IV | 7-7.8 mag. |
| .882 | 23.7 | 267.9 | 0.53 | IV | 7-8 |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Ocular. | Remarks. |
|-------|----------|----------|----------|---------|----------|
| | <i>h</i> | <i>°</i> | <i>'</i> | | |

Σ 2924 — Continued.

| | | | | | |
|----------|------------|--------|------|-------|---------------|
| 1895.769 | 21.5 | 270.4 | 0.63 | IV | Very blurred. |
| .780 | 20.1 | 271.3 | 0.71 | IV | Good. |
| .791 | 23.2 | 270.5 | 0.63 | IV | Very blurred. |
| .824 | 0.2 | 270.8 | 0.76 | IV | Good. |
| .856 | 0.1 | 270.3 | 0.75 | IV | Blurred. |
| 1895.249 | 7 <i>n</i> | 270.26 | 0.67 | Mean. | |

W. O. 52.

R. A., 22h 32m.8

Dec., +50° 40'

| | | | | | |
|----------|------------|--------|-------|-------|------------------|
| 1898.834 | 0.7 | 285.0 | 4.61 | III | 8 11 <i>mag.</i> |
| .845 | 21.1 | 284.6 | 4.47: | III | 8 11.5 |
| 1898.834 | 2 <i>n</i> | 284.80 | 4.54 | Mean. | |

Σ 2934.

R. A., 22h 36m.0

Dec., +20° 49'

| | | | | | |
|----------|------------|--------|------|--------|--|
| 1892.594 | 19.2 | 149.6 | 0.80 | III | |
| .709 | 23.4 | 154.2 | 0.99 | IV | |
| .743 | 22.7 | 152.2 | 0.83 | IV | |
| 1898.799 | 23.1 | 152.5 | 0.87 | IV | |
| .824 | 23.2 | 153.7 | 0.94 | IV | |
| .854 | 23.5 | 154.6 | 0.89 | IV | |
| 1892.682 | 8 <i>n</i> | 152.00 | 0.90 | Means. | |
| 93.626 | 8 <i>n</i> | 153.60 | 0.90 | | |

10—OB.

OBSERVATIONS OF DOUBLE STARS.

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Ocular. | Remarks. |
|-------|---------|----------|----------|---------|----------|
| | h | o | ' | | |

O Σ 477.

R. A., 22h 38m.8

Dec., +45° 23'

| | | | | | |
|----------|-----|-------|------|-----|---------------------------|
| 1893.824 | 1.0 | 184.6 | 4.38 | III | Good. Rectilinear motion. |
|----------|-----|-------|------|-----|---------------------------|

O Σ 481.

R. A., 22h 42m.0

Dec., +77° 54'

| | | | | | |
|----------|------|--------|------|-------|------------------------------|
| 1893.843 | 1.5 | 272.1 | 2.40 | IV | 7-9 mag. |
| .854 | 0.6 | 265.7 | 2.58 | III | Clouds. Obs. very difficult. |
| 1895.695 | 21.6 | 269.8 | 2.26 | IV | Bad seeing. |
| .769 | 21.7 | 270.8 | 2.43 | III | |
| .777 | 0.6 | 266.4 | 2.54 | V | |
| .807 | 21.7 | 271.4 | 2.75 | III | |
| 1895.124 | 6 n | 269.28 | 2.49 | Mean. | |

 β 848.

R. A., 22h 50m.0

Dec., +57° 44'

| | | | | | |
|----------|------|--------|------|--------|------------------------|
| 1895.824 | 23.7 | 357.4 | 2.45 | I |13 mag. Difficult. |
| .856 | 23.8 | 360.4 | 2.84 | III |13 |
| 1896.666 | 18.7 | 362.4 | 2.50 | V |13 |
| 1895.840 | 2 n | 358.90 | 2.64 | Means. | |
| 96.666 | 1 n | 362.40 | 2.50 | | |

O Σ 483. 52 PEGASI.

R. A., 22h 58m.2

Dec., +11° 5'

| | | | | | |
|----------|------|-------|------|----|-------------|
| 1893.760 | 23.6 | 215.2 | 0.80 | IV | Bad seeing. |
| .788 | 23.9 | 217.1 | 0.74 | IV | |
| .826 | 22.6 | 217.3 | 0.86 | IV | Blurred. |

| Date. | Sid T. | <i>p</i> | <i>s</i> | Ocular. | Remarks. |
|-------|--------|----------|----------|---------|----------|
| | h | . | . | | |

O Σ 483. 52 PEGASI — Continued.

| | | | | | |
|----------|------------|--------|------|--------|--|
| 1893.799 | 23.4 | 215.5 | 1.00 | IV | Blurred. Too blurred for <i>s</i> . |
| .815 | 0.9 | 220.1 | 1.02 | IV | |
| .824 | 23.7 | 215.8 | 0.89 | IV | |
| 1895.758 | 23.0 | 219.6 | 0.90 | III | |
| .780 | 22.8 | 218.0 | 1.09 | IV | |
| .804 | 22.7 | 218.9 | .... | IV | |
| .824 | 22.9 | 216.2 | 1.24 | VI | |
| 1892.791 | 3 <i>n</i> | 216.53 | 0.80 | Means. | |
| 93.813 | 3 <i>n</i> | 217.18 | 0.97 | | |
| 95.790 | 4—8 | 218.18 | 1.08 | | |

O Σ 489. π CEPHEI.

R. A., 23h 4m 1

Dec., +74° 45'

| | | | | | |
|----------|------------|-------|------|--------|----------------------------|
| 1892.769 | 18.5 | 36.4 | 0.96 | IV | Good. |
| .788 | 23.3 | 32.3 | 1.03 | IV | Good. |
| 1893.815 | 2 6 | 32.5 | 0.85 | IV | Very unsteady and blurred. |
| .848 | 20.8 | 219.9 | 1.01 | IV | |
| 1895.824 | 0.0 | 36.4 | 1.01 | IV | Well seen by glimpses. |
| .879 | 20.8 | 39.8 | 1.06 | IV | Blurred. |
| 1896.678 | 18.6 | 43.5 | 1.04 | IV | Good. |
| .681 | 19.0 | 44.0 | 0.98 | IV | Good. |
| 1892.778 | 2 <i>n</i> | 34.35 | 1.00 | Means. | |
| 93.829 | 2 <i>n</i> | 36.20 | 0.93 | | |
| 95.852 | 2 <i>n</i> | 38.10 | 1.04 | | |
| 96.677 | 2 <i>n</i> | 43.75 | 1.01 | | |

| Date. | Sid. T. | p | s | Ocular. | Remarks. |
|-------|---------|-----|-----|---------|----------|
| | h | ° | ' | | |

Σ 3050.

R. A., 23h 53m.4

Dec., +33° 5'

| | | | | | |
|----------|------|--------|------|-----|--|
| 1893.804 | 22.6 | 209.6 | 2.77 | III | |
| .815 | 1.1 | 209.7 | 2.75 | IV | |
| .824 | 23.9 | 212.0 | 2.68 | III | |
| 1895.775 | 22.6 | 210.8 | 2.51 | III | |
| 1894.804 | 4 n | 210.52 | 2.66 | | |

W. O. 60.

R. A., 23h 55m.8

Dec., +38° 58'

| | | | | | |
|----------|------|-------|------------------|-------|----------------|
| 1892.788 | 22.5 | 89.2 | 0.21 | IV | Not separated. |
| .804 | 21.2 | 88.0 | 0.25 <i>est.</i> | VIII | Elongated. |
| 1893.815 | 1.8 | 276.0 | 0.80 <i>est.</i> | IV | Elongated. |
| 1893.136 | 8 n | 91 07 | 0.23 | Mean. | |

85 PRGASI.

R. A., 23h 55m.9

Dec., +26° 27'

I have examined this star frequently, but have never seen the companion.

β 997.

R. A., 23h 58m.8

Dec., +45° 1'

| | | | | | |
|----------|------|-------|------|-----|--|
| 1895.840 | 22.2 | 333.0 | 4.09 | III | |
|----------|------|-------|------|-----|--|

OBSERVATIONS OF DOUBLE STARS.

77

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Ocular. | Remarks. |
|-------|----------|----------|----------|---------|----------|
| | <i>h</i> | <i>o</i> | <i>r</i> | | |

OS 547.

R. A., 23h 59m.2

Dec., +45° 9'

| | | | | | |
|----------|------|--------|------|-------|-------|
| 1895.862 | 20.9 | 127.7 | 4.48 | III | Good. |
| .879 | 21.2 | 125.7 | 4.44 | III | Good. |
| .900 | 21.9 | 126.0 | 4.16 | III | |
| 1895.880 | 3 n | 126.47 | 4.36 | Mean. | |

This star has a proper motion of 0".90 in the direction 98°. Porter. Proper Motion Stars.

Σ 3062.

R. A., 23h 59m.6

Dec., +57° 46'

| | | | | | |
|----------|------|--------|----------|--------|-------------------|
| 1892.769 | 18.8 | 328.4 | 1.43 | III | |
| .788 | 23.0 | 328.7 | 1.43 | IV | |
| .804 | 21.6 | 330.8 | 1.56 | IV | Blazing. |
| 1893.815 | 2.8 | 327.8 | 1.59 | IV | |
| .848 | 23.8 | 328.4 | 1.58 | IV | |
| 1895.184 | 6.8 | 332.8 | 1.10 (?) | III | Very poor seeing. |
| .186 | 5.6 | 331.0 | 1.46 | IV | Very poor seeing. |
| .758 | 0.9 | 334.4 | 1.62 | III | |
| .804 | 23.1 | 336.8 | 1.82 | III | |
| .818 | 22.7 | 331.8 | 1.73 | VI | Good. |
| .879 | 21.4 | 334.0 | 1.68 | IV | Blurred. |
| 1892.787 | 3 n | 329.18 | 1.47 | Means. | |
| 93.829 | 2 n | 327.85 | 1.58 | | |
| 95.604 | 6 n | 333.47 | 1.57 | | |

PUBLICATIONS
OF THE
WASHBURN OBSERVATORY

OF THE
UNIVERSITY OF WISCONSIN.

VOL. X. PART 2.

OBSERVATIONS OF EROS. 1900—1901.

BY GEORGE C. COMSTOCK,
DIRECTOR.

MADISON, WIS.:
DEMOCRAT PRINTING COMPANY, STATE PRINTER.
1901.

The Washburn Observatory,

FOUNDED BY

Cadwallader C. Washburn.

Born 1818; Died 1882.

INTRODUCTION.

The following observations of Eros were made with the 40-cm. (Clark), equatorial telescope of the Washburn Observatory, substantially in accordance with the plan proposed by the Paris Conference of July, 1900. For a description of the instrument reference may be made to Vols. I and VI of the Publications of the Washburn Observatory, and to Vol. IX for a supplementary account of the micrometer, including an investigation of the progressive error of its screw. Since the publication of Vol. IX the telescope has been provided with a new driving clock regulated by a double conical pendulum instead of the old Bond spring governor. This clock has performed admirably and has notably increased the efficiency of the instrument.

In the observations of the present series made prior to October 8, an achromatic ocular furnishing a magnifying power of 325 diameters and a field of 7.7 minutes of arc was employed. On October 8 and all subsequent nights this was replaced by an ocular specially constructed for this work, furnishing a magnifying power of 288 diameters and a field of 10.8 minutes. The lower power and larger field were chosen with a view to obtaining as often as possible two comparison stars situated on opposite sides of the planet and as nearly as possible symmetrically placed with respect to it. It has been found feasible to carry out this plan upon a large majority of all the nights upon which the planet was observed.

A preliminary set of observations of the planet was made upon September 29, 1900, but since the method of observing rectangular coordinates as recommended by the Paris Conference, was unfamiliar to me, this work is regarded as purely experimental and is not here reproduced. The observations that are considered suitable for a determination of the solar parallax were commenced on September 30 and continued thereafter on every clear night until January 23, 1901, during which interval the planet was observed on 57 nights and its position determined with respect to 105 comparison stars. It was my purpose in planning the observations to obtain a body of data that could be advantageously combined with similar observations made at European observatories, and since the difference of parallax involved in such a combination will be mainly shown in the coordinate perpendicular to the hour circle I endeavored in the early part of the work to observe the planet when it was as nearly as possible six hours east of the meridian. As this became impracticable on account of encroaching twilight, I began the principal observation of the evening at the earliest moment when the planet and a suitable comparison star could be seen and whenever two comparison stars were visible I arranged the observing programme so that the mean of the observed times of the micrometer pointings should be as nearly as possible the same for each coordinate of each star. A supplementary set of observations, usually limited to a single comparison star, was fre-

quently, but not always, made about two hours after the first series of observations. Save in the month of January when the planet could not be observed far east of the meridian, I have not attempted to secure observations near the time of the planet's culmination and equally I have made no attempt to observe it at large western hour angles.

After some preliminary experiments to determine the degree of precision that might be expected in the individual micrometer pointings I adopted as a normal observing programme when two stars, a and b , were to be compared with the planet, the following scheme in which x and y denote respectively the coordinates parallel and perpendicular to the hour circle:

| | |
|------------------|-----------------------|
| Observe ax , 4 | micrometer pointings. |
| " bx , 4 | " " |
| " by , 6 | " " |
| " ay , 6 | " " |

Interchange fixed and movable threads.

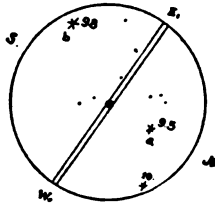
| | |
|------------------|-----------------------|
| Observe ay , 6 | micrometer pointings. |
| " by , 6 | " " |
| " bx , 4 | " " |
| " ax , 4 | " " |

Under normal conditions the execution of this programme occupied from 45 to 55 minutes but it was occasionally prolonged by untoward conditions or by increasing the number of micrometer settings when the observations proved unusually discordant or were on other grounds suspected to be of inferior precision. On the other hand prior to October 16 the number of settings in the y coordinate was usually 5 instead of 6 and on September 30 and October 2 only 4 settings were made in each coordinate.

Very frequently at the beginning of a set of observations daylight illumination sufficed to render the micrometer threads distinctly visible and they were then employed without artificial illumination. A little later, when the twilight had faded, the threads were illumined by a small incandescent lamp fed from a transformer which was controlled by an endless cord carried to the eye end of the telescope. By pulling upon this cord the amount of illumination given to the threads could be controlled at will. Since it can not be safely assumed that the coincidence of the micrometer threads will be the same under the different conditions of illumination above described, the normal observing programme was modified whenever necessary, so that the micrometer coincidence should be independently eliminated from the result of the daylight observations and also from those made with the artificial illumination.

As an aid to the identification of comparison stars it was my custom to make on each night a rough sketch of the field of view, showing the planet, the micrometer threads set to the parallel, the comparison stars with their estimated magnitudes

and such other stars, usually fainter ones, as might be considered expedient. A reproduction of one of these sketches, together with the following transcript from the notes of November 3, will serve to illustrate the character of the record.



SATURDAY, November 3. EROS.

a = B. D. 53°, 493

b = B. D. 53, 494

*a

97° 57', 277° 58'

*b

| <i>h</i> | <i>m</i> | <i>s</i> | <i>r</i> |
|----------|----------|----------|----------|
| 20 | 11 | 8 | 35.360 |
| | 12 | 41.5 | .395 |
| | 14 | 8 | 61.228 |
| | 14 | 58 | .131 |

†

Eros S. of *

| <i>h</i> | <i>m</i> | <i>s</i> | <i>r</i> |
|----------|----------|----------|----------|
| 20 | 18 | 27.5 | 71.594 |
| | 19 | 31.5 | .628 |
| | 20 | 24.5 | .637 |
| | 21 | 15.5 | .660 |

Eros N. of *

7° 52', 187° 56'

| | | | |
|----|----|------|--------|
| 20 | 30 | 27 | 48.924 |
| | 31 | 33 | .947 |
| | 32 | 27 | .851 |
| | 33 | 7 | .803 |
| | 33 | 45 | .761 |
| | 34 | 28.5 | .717 |

Eros follows *

| | | | |
|----|----|-----|--------|
| 20 | 35 | 36 | 47.909 |
| | 36 | 5 | .972 |
| | 37 | 8 | .993 |
| | 37 | 51 | .036 |
| | 39 | 2.5 | .170 |
| | 40 | 15 | 48.295 |

| | | | |
|----|----|------|--------|
| 20 | 24 | 31.5 | 51.000 |
| | 25 | 48 | .021 |
| | 26 | 32.5 | .142 |
| | 27 | 42 | .165 |
| | 28 | 46 | .261 |
| | 29 | 31.5 | .310 |

Eros precedes *

| | | | |
|----|----|------|--------|
| 20 | 41 | 47 | 44.459 |
| | 42 | 45 | .364 |
| | 43 | 25.5 | .364 |
| | 44 | 6.5 | .278 |
| | 44 | 53 | .276 |
| | 45 | 48 | .112 |

97° 58', 277° 57'

| | | | |
|----|----|----|--------|
| 20 | 53 | 22 | 36.532 |
| | 54 | 23 | .564 |
| | 55 | 44 | 59.984 |
| | 56 | 42 | .967 |

| | | | |
|----|----|-----|--------|
| 20 | 49 | 6.5 | 24.058 |
| | 50 | 6 | .064 |
| | 50 | 54 | .033 |
| | 51 | 40 | 23.982 |

† Daylight illumination.

Chronometer Comp. H 21 18 35
S 21 15 13.0

The determination of rectangular coordinates involves an accurate knowledge of the orientation of the micrometer threads and, with rare exceptions, a determination of the parallel was therefore made immediately after the principal observation of each

evening and, less frequently, a second determination was made after the supplementary observation. Leaving the telescope clamped at the declination of the planet it was turned eastward to an hour angle corresponding to that of the planet at the middle of the set of observations immediately preceding and the parallel there determined as follows: The movable micrometer thread was placed at a suitable distance, e. g. $15''$, from the fixed thread, the micrometer was set to a vernier reading, P' , such that the threads made an angle of about 3° with the assumed direction of the parallel and a star, usually of the eighth or ninth magnitude, was allowed to transit obliquely over the threads, the times of its transit being noted as accurately as possible, by eye and ear, in order to determine the interval, τ' , required to pass from one thread to the other. After a suitable number of determinations of τ' , usually four, the micrometer was turned to a new reading of the verniers, P'' , such that the threads made with the parallel an angle of approximately -3° , i. e. they crossed it from the other side. A value of the interval, τ'' , was now determined in the same manner as τ' and from these data the vernier reading, P_0 , corresponding to the apparent direction of the parallel is determined from the relation

$$P_0 = \frac{P' + P''}{2} + \frac{P' - P''}{2} \frac{\tau'' - \tau'}{\tau'' + \tau'}.$$

The following is an example of such a set of observations and their reduction:

SATURDAY, November 3, 1900.

| P | 101° 5', 281° 6' | | | | 95° 5', 275° 7' | | | |
|----------|------------------|-----------------------------|--------------|--------------|-------------------------|--------------|--------------|--------------|
| | ^s | ^s | ^s | ^s | ^s | ^s | ^s | ^s |
| Transits | 3.4 | 5.5 | 6.5 | 5.5 | 3.0 | 2.0 | 2.0 | 5.8 |
| | 35.3 | 36.7 | 37.4 | 35.7 | 36.5 | 35.3 | 35.5 | 40.0 |
| τ | 31.9 | 31.2 | 30.9 | 30.2 | 33.5 | 33.3 | 33.5 | 34.2 |
| <hr/> | | | | | | | | |
| P' | 101 5.5 | log $\frac{1}{2}(P' - P'')$ | | 2.254 π | $\frac{1}{2}(P' - P'')$ | -179.75 | | |
| P'' | 95 6.0 | log $(\tau'' - \tau')$ | | 0.410 | $\frac{1}{2}(P' + P'')$ | 98 5.75 | | |
| τ' | 31.05 | colog $(\tau'' + \tau')$ | | 8.189 | Corr. | - 7.13 | | |
| τ'' | 33.62 | log Corr. | | 0.853 π | P_0 | 97 58.62 | | |

As a check upon the sign of the correction it may be noted that if τ'' is greater than τ' , P_0 will fall nearer to P'' than to P' .

The value of the parallel thus determined in the same part of the sky in which the planet was observed is free from the effect of instrumental errors of adjustment but is affected by refraction and in the Bulletin du Comité International Permanent pour l'Exécution Photographique de la Carte du Ciel, Tome III, I have given formulae by which this effect may be taken into account and have also derived the expression above given for P_0 .

The following table contains the observed values of P_0 together with the hour angle and declination of the part of the sky at which they were determined, the correction

for refraction and the adopted value of the parallel. The computations have been carried to tenths of a minute of arc but the concluded values are rounded off to the nearest integral minute as the decimals are not supposed to have any real meaning. The least count of the micrometer verniers is 5' and although these verniers were carefully read by estimation to the nearest minute the precision of the readings can not be supposed to extend much beyond this limit. On the other hand this precision does not fall far short of one minute as may be seen by comparing values of the parallel determined on consecutive nights.

TABLE I. PARALLEL.

| 1900 | t | δ | Observed | Ref'n | Concluded |
|----------|--------------|--------------|------------------|-------|------------------|
| | ^h | [°] | [°] ' " | ' " | [°] ' " |
| Sept. 30 | -6.0 | 44 | 95 33 8 | +2.8 | 95 37 |
| Oct. 2 | 5.9 | 45 | 34.4 | 2.6 | 37 |
| 8 | 5.7 | 48 | 95 56.0 | 2.3 | 95 58 |
| 9 | 5.8 | 48 | 58.5 | 2.4 | 61 |
| 10 | 5.8 | 48 | 55.6 | 2.7 | 58 |
| 11 | 6.0 | 49 | 53.7 | 2.6 | 56 |
| 12 | 5.2 | 49 | 53.3 | 2.3 | 56 |
| 13 | 6.2 | 49 | 53.8 | 2.9 | 57 |
| 14 | 5.9 | 50 | 54.2 | 2.7 | 57 |
| 15 | 5.8 | 50 | 97 58.4 | 2.5 | 97 61 |
| 16 | 6.1 | 50 | 57.9 | 2.9 | 61 |
| 18 | 5.6 | 51 | 58.6 | 2.3 | 61 |
| 19 | 6.1 | 51 | 57.8 | 2.8 | 61 |
| 25 | 5.5 | 53 | 58.5 | 2.2 | 61 |
| 26 | 5.2 | 53 | 59.5 | 1.9 | 61 |
| Nov. 1 | 5.1 | 54 | 59.5 | 1.9 | 61 |
| 2 | 5.2 | 54 | 57.8 | 1.9 | 60 |
| 3 | 5.6 | 54 | 58.6 | 1.9 | 60 |
| 4 | 4.6 | 54 | 59.1 | 1.5 | 61 |
| 5 | 5.2 | 54 | 58.4 | 2.0 | 60 |
| 8 | 4.9 | 54 | 60.0 | 1.7 | 62 |
| 8 | 2.7 | 54 | 62.1 | 0.7 | 63 |
| 11 | -4.5 | 54 | 97 58.6 | +1.5 | 97 60 |

OBSERVATIONS OF EROS.

TABLE I.—Continued.

| 1890 | t | δ | Observed | Ref'n | Concluded |
|---------|--------------|--------------|------------------|-------|------------------|
| | ^h | [°] | [°] ' " | ' " | [°] ' " |
| Nov. 15 | -4.5 | 54 | 97 59.9 | +1.5 | 97 61 |
| 15 | 1.9 | 54 | 62.6 | 0.4 | 63 |
| 21 | 4.2 | 53 | 56.9 | 1.3 | 58 |
| 22 | 2.9 | 53 | 56.9 | 0.8 | 58 |
| 23 | 2.1 | 53 | 58.4 | 0.6 | 59 |
| 25 | 3.8 | 52 | 59.5 | 0.8 | 60 |
| 25 | 1.6 | 52 | 60.6 | 0.4 | 61 |
| 26 | 3.7 | 52 | 55.7 | 0.8 | 57 |
| 26 | 1.5 | 52 | 58.8 | 0.4 | 59 |
| 27 | 3.9 | 52 | 58.5 | 0.9 | 59 |
| 29 | 3.6 | 51 | 58.1 | 1.0 | 59 |
| 29 | 1.2 | 51 | 59.3 | 0.2 | 60 |
| Dec. 8 | 2.6 | 48 | 59.7 | 0.7 | 60 |
| 8 | 2.2 | 24 | 56.4 | 0.1 | 56 |
| 9 | 2.9 | 48 | 58.4 | 0.8 | 59 |
| 10 | 2.8 | 47 | 59.3 | 0.8 | 60 |
| 11 | 2.7 | 47 | 59.6 | 0.7 | 60 |
| 12 | 2.9 | 46 | 60.1 | 0.8 | 61 |
| 18 | 2.5 | 44 | 58.4 | 0.7 | 59 |
| 20 | 2.1 | 43 | 57.9 | 0.4 | 58 |
| 28 | 1.8 | 40 | 59.0 | 0.4 | 59 |
| 29 | -1.6 | 39 | 62.5 | +0.3 | 63 |
| 29 | +0.5 | 39 | 55.4 | -0.1 | 55 |
| 31 | -1.7 | 38 | 56.0 | +0.3 | 56 |
| Jan. 1 | -1.6 | 38 | 58.8 | +0.3 | 59 |
| 1 | +0.6 | 38 | 55.6 | -0.1 | 56 |
| 14 | -1.2 | 33 | 57.9 | +0.2 | 58 |
| 17 | -0.9 | 31 | 59.6 | +0.2 | 60 |
| 19 | -0.9 | 30 | 59.5 | +0.2 | 60 |
| 21 | -1.2 | 29 | 97 59.9 | +0.2 | 97 60 |

ADOPTED VALUES OF THE PARALLEL.

| | |
|-------------------|--------------|
| Sept. 30 — Oct. 2 | 95° 37'.0 |
| Oct. 8 — Oct. 14 | 95 57.6 |
| Oct. 15 — Oct. 25 | 97 60.8 |
| Oct. 26 — Nov. 5 | 97 60.7 |
| Nov. 8 — Nov. 15 | 97 61.4 |
| Nov. 21 — Jan. 23 | 97 59.8 East |
| Nov. 21 — Jan. 23 | 97 56.0 West |

An examination of the numbers contained in the last column of the preceding table shows little trace of a systematic change in the parallel for different parts of the sky and the agreement of the several results is not improved by applying to them corrections for the deviation of the polar axis from the true pole of the heavens. From a determination made on April 28, 1901, it appears that the polar axis produced meets the sky at a point whose east hour angle is 140° and whose polar distance is $1'.5$. Corrections required to reduce the observed, true, parallel to the position of the instrumental pole vary from $+1'.5$ to $+2'.5$ and since they produce no increased agreement among the observations I conclude that their influence is masked by flexure effects.

The large changes in P_0 following Oct. 2 and Oct. 14 were produced by adjustments of the micrometer. From Oct. 15 to Jan. 23 no intentional change was made in the adjustment of the micrometer and it would perhaps have been proper to assume a mean value of the parallel for the entire period but I have preferred to break the period into sections, as shown at the foot of the table, and within these sections to use mean values of the parallel as there shown. The distinction made in the last section between values of the parallel to be used for east and west hour angles appears to me to be required since in passing from one side of the meridian to the other the telescope is reversed and its parts come into entirely new relations to each other thus rendering the flexure effects presumably different in the two cases.

From a consideration of the residuals furnished by the individual determinations within the several sections I find for the probable error of a single result, $r_1 = \pm 0'.80$ and corresponding to this the probable error of an average adopted parallel will be included between $20''$ and $30''$.

The times corresponding to the several micrometer settings were noted, to the nearest half second, from a sidereal chronometer which was compared with the standard observatory clock, Hohwü, No. 32, immediately after the principal observation of each evening. The resulting chronometer corrections are shown in Table II, and in connection with this table it should be noted that the discordant value of

2 OB.

Oct. 8 arises from the use of a different chronometer on that night. The bracketed value for Nov. 4 probably is due to an error of one second in the comparison and a value, $+65^{\circ}2$, has been used in the reduction of the observation of that date.

TABLE II. CHRONOMETER CORRECTIONS.

| 1900 | Sid. Hour | Chron. ΔT | | 1900-1901 | Sid. Hour | Chron. ΔT | |
|----------|-----------|-------------------|--------|-----------|-----------|-------------------|------|
| | h | m | s | | h | m | s |
| Sept. 30 | 21.5 | +0 | 59.7 | Nov. 15 | 0.5 | +0 | 62.4 |
| Oct. 2 | 21.6 | | 59.8 | 21 | 22.4 | | 59.4 |
| 8 | 22.1 | | 32.2 | 22 | 23.3 | | 59.0 |
| 9 | 21.8 | | 61.2 | 23 | 0.2 | | 59.1 |
| 10 | 21.9 | | 61.9 | 25 | 22.5 | | 58.2 |
| 11 | 21.7 | | 62.2 | 26 | 22.5 | | 58.1 |
| 12 | 22.4 | | 62.8 | 26 | 0.7 | | 58.2 |
| 13 | 21.3 | | 63.2 | 27 | 22.3 | | 57.6 |
| 14 | 21.7 | | 63.7 | 29 | 22.5 | | 57.0 |
| 15 | 21.9 | | 64.0 | Dec. 5 | 23.1 | | 55.4 |
| 16 | 21.5 | | 64.5 | 8 | 23.5 | | 54.7 |
| 17 | 21.3 | | 64.4 | 9 | 23.4 | | 55.5 |
| 18 | 22.0 | | 64.7 | 10 | 23.2 | | 55.6 |
| 19 | 21.4 | | 64.9 | 11 | 23.4 | | 55.6 |
| 20 | 22.2 | | 65.2 | 12 | 23.3 | | 57.2 |
| 25 | 21.8 | | 65.6 | 18 | 23.9 | | 55.1 |
| 26 | 21.9 | | 65.7 | 19 | 0.0 | | 55.4 |
| Nov. 1 | 21.9 | | 65.5 | 20 | 0.2 | | 56.0 |
| 2 | 22.0 | | 65.4 | 26 | 0.7 | | 56.5 |
| 3 | 21.3 | | 65.3 | 28 | 0.8 | | 57.0 |
| 4 | 22.3 | | [66.2] | 29 | 0.9 | | 57.9 |
| 5 | 21.7 | | 65.0 | 29 | 3.1 | | 58.7 |
| 8 | 21.8 | | 64.5 | 31 | 1.1 | | 60.6 |
| 11 | 22.2 | | 63.6 | Jan. 1 | 1.2 | | 61.7 |
| 15 | 22.1 | +0 | 62.2 | 2 | 1.1 | +0 | 63.8 |

TABLE II.—Continued.

| 1900 | Sid. Hour | Chron. ΔT | 1900-1901 | Sid. Hour | Chron. ΔT |
|--------|-----------|-------------------|-----------|-----------|-------------------|
| | h | m s | | h | m s |
| Jan. 3 | 3.5 | +0 64.1 | Jan. 17 | 2.7 | +0 71.4 |
| 8 | 2 0 | 66 8 | 18 | 2.4 | 72.1 |
| 12 | 2.2 | 67.6 | 19 | 2.7 | 73.0 |
| 14 | 2.3 | 68.8 | 21 | 2.4 | 74.1 |
| 16 | 2.2 | +0 70 6 | 23 | 2.9 | +0 76.4 |

During the progress of the observations it was my impression that the average accidental error of estimating the time at which a particular micrometer setting was made was not far from 0.5 but as an error of this kind is not readily separable from an error in the micrometer pointing I have not attempted to obtain a precise value of the probable error in question. Probably of greater consequence than this accidental error is a systematic error which I am inclined to think exists in all the observations. The observer in seeking to identify the chronometer beat at which his judgment is formed that the distance between the threads is equal to the distance between the star and planet, loses a certain amount of time; he is not conscious that his mind is made up until after the judgment has been formed, and he therefore tends to record a later time than that at which the judgment was in fact made. There is thus produced a species of personal equation whose precise magnitude I am unable to determine but which in my own case I think may easily amount to a second of time or even more.

MICROMETER.—It is shown in Vol. VI, Publications of the Washburn Observatory, that the periodic errors of the micrometer screw here employed are practically insensible and in the present work they are ignored. The progressive errors of the screw are investigated in Vol. IX of the same publications and from the data of that volume I have interpolated the following table of corrections which have been applied to all readings of the screw in the reduction of the present observations.

TABLE III. ERRORS OF THE SCREW.

| R | Corr. | R | Corr. | R | Corr. |
|----|--------------------|----|--------------------|----|--------------------|
| 5 | +0.061 <i>rev.</i> | 35 | +0.005 <i>rev.</i> | 65 | +0.011 <i>rev.</i> |
| 6 | .061 | 36 | .004 | 66 | .011 |
| 7 | .060 | 37 | .003 | 67 | .012 |
| 8 | .059 | 38 | .002 | 68 | .013 |
| 9 | .058 | 39 | .001 | 69 | .014 |
| 10 | +0.057 | 40 | +0.001 | 70 | +0.015 |
| 11 | .056 | 41 | .001 | 71 | .015 |
| 12 | .054 | 42 | .000 | 72 | .016 |
| 13 | .053 | 43 | .000 | 73 | .017 |
| 14 | .051 | 44 | .000 | 74 | .017 |
| 15 | +0.049 | 45 | -0.001 | 75 | +0.018 |
| 16 | .047 | 46 | .001 | 76 | .018 |
| 17 | .045 | 47 | — .001 | 77 | .019 |
| 18 | .042 | 48 | .000 | 78 | .019 |
| 19 | .040 | 49 | .000 | 79 | .020 |
| 20 | +0.037 | 50 | +0.000 | 80 | +0.021 |
| 21 | .035 | 51 | .000 | 81 | .021 |
| 22 | .032 | 52 | .000 | 82 | .022 |
| 23 | .030 | 53 | .001 | 83 | .022 |
| 24 | .027 | 54 | .001 | 84 | .023 |
| 25 | +0.025 | 55 | +0.002 | 85 | +0.023 |
| 26 | .023 | 56 | .002 | 86 | .024 |
| 27 | .020 | 57 | .003 | 87 | .024 |
| 28 | .018 | 58 | .004 | 88 | .024 |
| 29 | .016 | 59 | .005 | 89 | .025 |
| 30 | +0.014 | 60 | +0.006 | 90 | +0.025 |
| 31 | .012 | 61 | .007 | 91 | .025 |
| 32 | .010 | 62 | .008 | 92 | .026 |
| 33 | .008 | 63 | .009 | 93 | .026 |
| 34 | .007 | 64 | .010 | 94 | .027 |
| 35 | +0.005 | 65 | +0.011 | 95 | +0.027 |

At the beginning of the Eros observations the tail piece of the telescope was clamped at a fixed setting and was not disturbed until the close of the observations. The micrometer was once removed from the telescope, Oct. 3, and was on Oct. 15 screwed tighter to the tail piece, to the extent shown in the determinations of parallel. Aside from these adjustments, whose effect upon the value of a revolution of the screw is entirely inappreciable, no intentional change was made in the focal adjustments of the telescope and it is therefore assumed that save for the effect of temperature a constant value of a revolution of the screw may be employed in the reduction of these observations. To determine this value I have observed differences of declination between the stars,

11 Pleiadum — 28 Pleiadum, $\Delta\delta = 2442''.72$

m Pleiadum — 11 Pleiadum, $\Delta\delta = 2638''.59$

whose adopted differences of declination have been derived from Elkin's triangulation and are referred to the mean equinox of 1900.0. For each pair of stars the distance was measured in eight steps. For reduction to the apparent equinox of the date I have used Bessel's day numbers as given in the American Ephemeris and the following constant logarithmic coefficients.

$$11-28 \text{ Pleiadum. } [9.090] A + [7.602] B - [7.954] C + [7.954] D$$

$$m-11 \text{ Pleiadum. } [9.037] A + [7.477] B - [8.079] C + [7.903] D$$

Each difference of declination has been observed on three nights and the resulting values of one revolution of the screw are as follows:

TABLE IV. DETERMINATION OF R.

| 1900 | Temp. | Stars | Obs'd R | Red'n to 0° | R ₀ |
|---------|-------|--------|---------|-------------|----------------|
| Oct. 26 | +13°C | 11, 28 | 10.449 | +0.002 | 10.451 |
| Nov. 1 | + 7 | m, 11 | .452 | + .001 | .453 |
| 22 | - 2 | 11, 28 | .464 | .000 | .464 |
| 25 | - 1 | m, 11 | .452 | .000 | .452 |
| Dec. 8 | + 2 | 11, 28 | .453 | .000 | .453 |
| 11 | -11 | m, 11 | .461 | - .002 | .459 |

The temperature coefficient of the screw, $-0''.00018 t$, where t represents the temperature in degrees Centigrade, is adopted from the discussion in Vol. VI, Publications of the Washburn Observatory. While these determinations of R_0 would be better satisfied by a larger temperature coefficient, the data is not sufficient to warrant any change and I therefore adopt as a mean result,

$$\text{One Revolution} = 10''.4553 - 0''.00018 t.$$

I estimate the probable error of this result at approximately $\pm 0''.0020$ when due allowance is made for probable sources of systematic error as well as for discordance of the results among themselves.

In the application of this value to transform revolutions of the screw into seconds of arc I have used the following table of multiples of R_0 together with the supplementary table of temperature corrections which follows it.

TABLE V. MICROMETER EQUIVALENTS.

| r | r | r | r | r | r | r | r |
|-----|----------|-----|----------|-----|----------|-----|----------|
| 1 | 10.4553 | 11 | 115.0083 | 21 | 219.5613 | 31 | 324.1143 |
| 2 | 20.9106 | 12 | 125.4636 | 22 | 230.0166 | 32 | 334.5696 |
| 3 | 31.3659 | 13 | 135.9189 | 23 | 240.4719 | 33 | 345.0249 |
| 4 | 41.8212 | 14 | 146.3742 | 24 | 250.9272 | 34 | 355.4802 |
| 5 | 52.2765 | 15 | 156.8295 | 25 | 261.3825 | 35 | 365.9355 |
| 6 | 62.7318 | 16 | 167.2848 | 26 | 271.8378 | 36 | 376.3908 |
| 7 | 73.1871 | 17 | 177.7401 | 27 | 282.2931 | 37 | 386.8461 |
| 8 | 83.6424 | 18 | 188.1954 | 28 | 292.7484 | 38 | 397.3014 |
| 9 | 94.0977 | 19 | 198.6507 | 29 | 303.2037 | 39 | 407.7567 |
| 10 | 104.5530 | 20 | 209.1060 | 30 | 313.6590 | 40 | 418.2120 |

TABLE VI. TEMPERATURE CORRECTIONS.

| $\frac{t}{s}$ | 100" | 200" | 300" | 400" |
|---------------|--------|--------|--------|--------|
| -20° C | +0".04 | +0".07 | +0".11 | +0".14 |
| -10 | + .02 | + .04 | + .05 | + .07 |
| 0 | .00 | .00 | .00 | .00 |
| +10 | - .02 | - .04 | - .05 | - .07 |
| +20 | - .04 | - .07 | - .11 | - .14 |

REDUCTION OF THE OBSERVATIONS.—I have published in Vol. III of the Bulletin du Comité International Permanent pour l'Exécution Photographique de la Carte du Ciel, formulae for the reduction of these observations and referring to that volume for fuller details I reproduce here the formulae actually employed in the present case.

ORIENTATION OF THE THREADS.—Premising that x and y represent measured coordinates approximately parallel and perpendicular to the hour circle, if P_o represents the true direction of the parallel and P' the direction of the threads corresponding to an observation of the x coordinate we shall have for the corrected value of this coordinate

$$x_o = x + 0.000291 (P_o - P')y$$

and for a similar observation of the y coordinate

$$y_o = y + 0.000291 (90^\circ + P' - P_o)x$$

where the quantity within the parenthesis is to be expressed in minutes of arc. Strictly, the first term of the second member of each equation should be multiplied by the cosine of the orientation error and in the few cases where its effect is sensible this has been done.

The actual vernier readings at which the micrometer was clamped in each set of observations are given in the second column of Table XII under the heading *P*, where readings differing but little from 90° correspond to measurements of the coordinate x , i. e. declination. The computed corrections to the observed coordinates are given in the fifth column of the same table under the heading, Parallel. The signs of these corrections are determined in accordance with the convention that coordinates measured from the planet toward the north and east are positive.

REFRACTION.—The effect of refraction upon the measured coordinates is represented by means of two auxiliaries, X , Y , which, in terms of the declination, δ , and Bessel's auxiliaries, N , $\cot n$, are determined by the equations

$$\begin{aligned}\tan X &= \cot (N + \delta) \\ \tan Y &= \operatorname{cosec} (N + \delta) \cot n.\end{aligned}$$

In terms of these auxiliaries we have for the corrected values of the coordinates,

$$\begin{aligned}x_o &= x + \mu \sec^2 X \cdot x + \mu \tan X \tan Y \cdot y \\ y_o &= y + \mu \sec^2 Y \cdot y + \mu \tan X \tan Y \cdot x\end{aligned}$$

where the refraction coefficient μ , the α of Bessel's refraction tables, may be derived with sufficient precision from Table VII which is constructed from the Pulkowa Refraction Tables for a mean barometric pressure of 736.5 mm. The argument, z , is the true zenith distance.

TABLE VII. REFRACTIONS.

| z | $\log A.$ | t | $\log B - \log(271^\circ + t)$ | |
|-----------|-----------|----------------------|--------------------------------|-----|
| 0° | 6.0175 | -30°C. | 0.4852 | 177 |
| 10 | .0175 | 20 | .4675 | 170 |
| 20 | .0174 | 10 | .4505 | 163 |
| 30 | .0173 | 0 | .4342 | 157 |
| 40 | .0171 | 10 | .4185 | 152 |
| 50 | .0167 | 20 | .4033 | 147 |
| 60 | .0157 | +30 | .3886 | |
| 70 | .0130 | | | |

$$\log \mu = \log A + \{ \log B - \log (271 + t) \}$$

In the actual computation of the refractions the true barometric pressure of the date was employed instead of the mean value of $\log B$ given above, but the resulting

TABLE VIII.—Continued.

| t | | $\log \alpha$ | $\log \beta$ | γ | | |
|-----|-----|---------------|--------------|------------|-----|------|
| h | m | | | $^{\circ}$ | $'$ | $''$ |
| 2 | 0 | 9.9681 | 9.5633 | 47 | 0 | |
| | | | | | | 45 |
| | 10 | .9628 | .5945 | 47 | 45 | |
| | | | | | | 50 |
| | 20 | .9572 | .6229 | 48 | 35 | |
| | | | | | | 55 |
| | 30 | .9512 | .6487 | 49 | 30 | |
| | | | | | | 59 |
| | 40 | .9449 | .6724 | 50 | 29 | |
| | | | | | | 64 |
| 3 | 0 | 9.9315 | 9.7138 | 51 | 33 | |
| | | | | | | 70 |
| | 10 | .9244 | .7319 | 52 | 43 | |
| | | | | | | 75 |
| | 20 | .9172 | .7487 | 53 | 58 | |
| | | | | | | 81 |
| | 30 | .9098 | .7638 | 55 | 19 | |
| | | | | | | 86 |
| | 40 | .9024 | .7777 | 56 | 45 | |
| | | | | | | 93 |
| 4 | 0 | 9.8875 | 9.8018 | 58 | 18 | |
| | | | | | | 99 |
| | 10 | .8949 | .7903 | 59 | 57 | |
| | | | | | | 105 |
| | 20 | .8802 | .8122 | 61 | 42 | |
| | | | | | | 112 |
| | 30 | .8663 | .8299 | 63 | 34 | |
| | | | | | | 118 |
| | 40 | .8598 | .8373 | 65 | 32 | |
| | | | | | | 124 |
| 5 | 0 | 9.8484 | 9.8492 | 67 | 36 | |
| | | | | | | 131 |
| | 10 | .8437 | .8539 | 69 | 47 | |
| | | | | | | 137 |
| | 20 | .8396 | .8577 | 72 | 4 | |
| | | | | | | 142 |
| | 30 | .8364 | .8606 | 74 | 26 | |
| | | | | | | 147 |
| | 40 | .8341 | .8626 | 76 | 53 | |
| | | | | | | 152 |
| 6 | 0 | 9.8322 | 9.8643 | 79 | 25 | |
| | | | | | | 156 |
| | 10 | .8327 | .8639 | 82 | 1 | |
| | | | | | | 158 |
| | 20 | .8396 | .8577 | 84 | 39 | |
| | | | | | | 160 |
| | 30 | .8364 | .8606 | 87 | 19 | |
| | | | | | | 161 |
| | 40 | .8341 | .8626 | 90 | 0 | |
| | | | | | | |

In the computation of the parallax factors for dates prior to Nov. 29 the coordinates of the planet for the mean time of observation were interpolated from the ephemeris contained in Circular No. 3, issued under the auspices of the Conférence Astrophotographique Internationale de Juillet, 1900, corrected where necessary to bring it into agreement with the ephemerides given by Millosevich in Nos. 3660-3662

3 OB.

of the *Astronomische Nachrichten*. For Nov. 29 and subsequent dates the coordinates were interpolated directly from the ephemerides last named.

In accordance with the investigation which I have published in No. 490 of the *Astronomical Journal* the effect of refraction has been computed for the mean position of the planet during each series of observations, i. e. the refraction is assumed to vary proportionally to the time, for periods not exceeding one hour in duration. But this assumption can not safely be made for the effect of parallax and I have therefore computed for the observations of each night an ephemeris of the parallax factor in each coordinate, covering, at intervals of ten minutes, the entire time over which the observations extended. From this ephemeris there have been interpolated, with due regard to second differences, the value of the parallax factor corresponding to the mean of the times in each of the eight sets of pointings that compose a normal comparison of the planet with two stars. An example of such an ephemeris and the factors as interpolated from it is given below for the date Nov. 3. The argument of the table is the chronometer time and the interpolated quantities correspond to the means of the chronometer times as shown at p. 29.

TABLE IX. COMPUTATION OF PARALLAX FACTORS FOR NOV. 3.

| Chronometer | | x , (Dec.) | y , (R.A.) | | |
|-----------------|-----------------|--------------|--------------|-----|-----|
| 20 ^h | 10 ^m | +1.0035 | —1.8414 | | |
| | 20 | 0.9387 | 1.8393 | 648 | 21 |
| | 30 | 0.8740 | 1.8340 | 647 | 53 |
| | 40 | 0.8093 | 1.8254 | 647 | 86 |
| | 50 | +0.7447 | —1.8135 | 646 | 119 |

INTERPOLATED QUANTITIES.

| | | | | | | | | | |
|------|----|----|------|--------|------|----|----|------|--------|
| ax | 20 | 13 | 13.8 | 0.9826 | bx | 20 | 19 | 54.8 | 0.9393 |
| | | 55 | 2.8 | .7121 | | | 50 | 26.6 | .7421 |
| | 20 | 34 | 8.4 | 0.8473 | | 20 | 35 | 10.7 | 0.8407 |
| ay | 20 | 32 | 37.9 | 1.8321 | by | 20 | 27 | 8.7 | 1.8359 |
| | | 37 | 39.6 | .8277 | | | 43 | 47.5 | .8213 |
| | 20 | 35 | 8.8 | 1.8299 | | 20 | 38 | 28.1 | 1.8286 |

A comparison of the differences in these ephemerides for consecutive dates has served as a check against gross errors in their computation. The adopted values of the parallax factors are given in the seventh column of Table XII. These factors when multiplied into the solar parallax furnish corrections which if subtracted from the adopted coordinates shown in Table XII will furnish values of the geocentric coordinates of the comparison star referred to the planet as origin.

In the reduction of the observations the means of the chronometer times of each

set of four or six micrometer pointings as shown at p. 5 were formed, entered in the observing book and checked by a duplicate computation. Similarly the means of the micrometer readings were formed, entered in the book and checked. The corrections for progressive error of the screw were next entered immediately below the mean micrometer readings and the sums of these quantities were then transferred to reduction sheets. These sums are reproduced under the heading Micrometer in the fourth column of Table XII, and the mean of the corresponding chronometer times is given in the third column of the same table. The two sets of observations that are to be combined in order to form the adopted value of a coordinate are printed on consecutive lines.

The normal procedure above outlined was occasionally varied as follows: In the rather frequent cases where the micrometer coincidence was eliminated within a single set, e. g. in the first set shown under *a at p. 5, the mean of the observed distances, in revolutions of the screw, was formed, entered in the observing book, corrected for error of the screw, transferred to the reduction sheets and reappears in Table XII enclosed in square brackets, to indicate that the number thus marked is not a micrometer reading but a measured coordinate expressed in revolutions of the screw. The signs +, — which in a few cases are prefixed to these bracketed numbers or to the micrometer readings entered in this column, indicate a change of sign in the coordinate between the epochs of the corresponding sets of observations.

Early in the course of the observations it became apparent that a very small distance between the planet and a star in one coordinate accompanied by a large difference in the other coordinate, e. g. x equal to $2''$ and y equal to $200''$, was prejudicial to the accuracy of the micrometer settings since in the measurement of the small coordinate each thread then interfered with the observer's judgment of the bisection of the star by the other thread. In such cases I have resorted to the measurement of position angles for the determination of the small coordinate, making four or six settings of the threads in place of four or six micrometer pointings of the ordinary kind. The mean of the corresponding readings of the position circle is entered in the column Micrometer of Table XII, but this mean has not been used in the computation of the printed coordinate. In place of it there was formed the mean of each pair of consecutive vernier readings together with the mean of the corresponding times and the corresponding value of the large coordinate, e. g. y when x was determined from position angles. The solution of the right angled triangle determined by these data in connection with the known reading for the parallel, then furnished a value of the required coordinate and the mean of these computed values is given in Table XII.

The second column of Table XII shows the reading of the position circle at which the micrometer was clamped for each set of observations and the correction required to transform the measured coordinate to its value in a system corresponding to the

adopted vernier reading for the parallel is shown in the fifth column of the table under the heading, Parallel. It is to be noted that in respect of sign these numbers are corrections to the coordinates instead of the micrometer readings.

PRECISION OF THE OBSERVATIONS.—During the progress of the work I determined from time to time, by reducing to a common epoch the individual micrometer settings, the probable error of a single setting, including of course the probable error of noting the time and of reading the screw head, and as these figures may be of some service in estimating the quality of the work they are reproduced here. It is to be understood that they make no pretense of being a complete discussion of the observations but they are supposed to be fairly typical of their quality, the particular observations discussed for this purpose having been chosen from good and bad alike without conscious preference being given to either.

P. E. OF A SINGLE MICROMETER SETTING.

| Epoch. | In R. A. | In Dec. |
|------------------|------------|------------|
| Sept. 30-Oct. 31 | ± 0.24 | ± 0.24 |
| Nov. 1-Dec. 15 | 0.23 | 0.22 |
| Dec. 16-Jan. 23 | 0.40 | 0.40 |

It appears from these numbers that the micrometer settings are equally precise in the two coordinates, a fact which does not agree with my own impressions at the telescope. The instrument being less stable in right ascension than in declination, on account of a certain unavoidable play in the driving gear, the observations in the former coordinate were appreciably more difficult and vexatious than in the latter. The numerical agreement found above probably indicates that the vexatious element corresponds to an increased care and painstaking on the part of the observer. In some measure this supposition is strengthened by the fact that on the average the time interval between consecutive pointings in right ascension is about 15 per cent. greater than the corresponding interval between pointings in declination. The marked reduction of precision shown by the increased probable errors of January and the latter half of December is real and arises from low temperatures and the small zenith distance of the planet, elements which produced uncomfortable conditions and a constrained position of the observer. This is in part compensated by an increased number of micrometer settings, but upon the whole the observations of the last five weeks must be regarded as of inferior precision to those of earlier date.

From the probable error of a single micrometer pointing as given above and the average number of such pointings, 8 and 12 respectively, which enter into an adopted coordinate the probable error of such a coordinate may be readily obtained, provided no sources of error enter into the determination other than those which

are represented in the discordances of the individual pointings. Thus for observations prior to Dec. 15 we find for the x and y coordinates respectively $r_1 = \pm 0.073$ and $r_1 = \pm 0.068$, but these results need confirmation and values more satisfactory in principle may be obtained as follows: When the planet has been referred to each of two comparison stars, a and b , at two different epochs, if the observations at a given epoch are simultaneous we shall have the difference of rectangular coordinates of the stars determined through the planet and this difference of coordinates must be the same at both epochs. If the observations are only approximately simultaneous they may be reduced to the ideal case above considered by applying to the measured coordinates minute corrections depending upon the observed motion of the planet in the interval between the two epochs. In the present series of observations there are five nights upon which these conditions are fulfilled and the corresponding results are shown in the following table where the number under the heading ax represents the x coordinate of star a at the time placed opposite it in the column entitled Epoch, and similarly for the quantities bx , ay , by . These numbers are derived from the data contained in Table XII by applying to the numbers there given, corrections for parallax and for the motion of the planet in the interval between the time of observation and the assumed epoch. The assumed rate of the planet's motion, per second of time, as derived from a comparison of observations at the two epochs is given in the last column of the table. The resulting differences of coordinates of the comparison stars, $ax - bx$ and $ay - by$, are shown in the seventh and eighth columns, together with their differences which represent accumulated errors of observation in the four coordinates that enter into each of these differences. These four observations are, in fact, connected by a rigorous condition which may be written in the form

$$ax_1 - bx_1 + bx_2 - ax_2 = 0,$$

with a similar condition among the y coordinates, and the measured coordinates should be adjusted to these conditions by distributing equally among them the residual error shown in the table.

TABLE X. PRECISION OF THE OBSERVATIONS.

| Date. | Epoch. | ax | bx | ay | by | $ax-bx$ | $ay-by$ | Var. per 1s |
|--------|---|---------|---------|---------|---------|---------|---------|-------------|
| Nov. 3 | $\begin{smallmatrix} h & m \\ 5 & 45 \end{smallmatrix}$ | +121.02 | -256.26 | + 11.68 | + 52.05 | +377.28 | - 40.37 | -0.0040 |
| | 7 49 | + 91.78 | -286.14 | +102.25 | +143.24 | 377.92 | - 40.99 | +0.0122 |
| | | | | | | - 0.64 | + 0.62 | |
| Nov. 8 | 5 56 | + 43.16 | - 32.52 | - 28.22 | + 51.17 | + 75.68 | - 79.39 | -0.0005 |
| | 8 13 | + 38.98 | - 36.76 | + 74.58 | +154.09 | + 75.74 | - 79.51 | +0.0125 |
| | | | | | | - 0.06 | + 0.12 | |

TABLE X—Continued.

| Date. | Epoch. | ax | bx | ay | by | $ax-bx$ | $ay-by$ | Var. per 1s |
|---------|---|---------|---------|---------|---------|---------|---------|-------------|
| Nov. 25 | $\begin{smallmatrix} h & m \\ 5 & 25 \end{smallmatrix}$ | — 27.04 | — 96.86 | +237.38 | —285.18 | + 69.82 | +522.56 | +0.0108 |
| | $\begin{smallmatrix} h & m \\ 7 & 39 \end{smallmatrix}$ | + 59.89 | — 9.72 | +291.63 | —230.76 | + 69.61 | +522.39 | +0.0067 |
| | | | | | | + 0.21 | + 0.17 | |
| Nov. 26 | $\begin{smallmatrix} h & m \\ 5 & 26 \end{smallmatrix}$ | —316.97 | +284.74 | +148.07 | +157.17 | —601.71 | — 9.10 | +0.0113 |
| | $\begin{smallmatrix} h & m \\ 7 & 39 \end{smallmatrix}$ | —226.85 | +374.95 | +197.48 | +206.43 | —601.80 | — 8.95 | +0.0062 |
| | | | | | | + 0.09 | — 0.15 | |
| Nov. 29 | $\begin{smallmatrix} h & m \\ 5 & 15 \end{smallmatrix}$ | + 23.65 | — 99.66 | + 81.94 | +142.43 | +123.31 | — 60.49 | +0.0128 |
| | $\begin{smallmatrix} h & m \\ 7 & 43 \end{smallmatrix}$ | +136.74 | + 13.62 | +118.72 | +179.15 | +123.12 | — 60.43 | +0.0041 |
| | | | | | | + 0.19 | — 0.06 | |

At first sight there appears to be something anomalous connected with the observations of November 3, but a careful revision of the record and reductions shows nothing of the kind save the residual errors themselves, which in each coordinate are about three times greater than the largest error which is found upon any other night. Under these circumstances it appears to me imperative to include these errors with undiminished weight in deriving the probable error of a single coordinate and I find in this manner, without distinction between the x and y coordinates, $r_1 = \pm 0''.10$ which is adopted as representing the average precision of a single coordinate of Table XII for dates prior to December 15. It has already been noted that for subsequent dates the accidental errors of observation are greater and the precision of the adopted coordinates presumably less, than in the earlier part of the work.

In another respect the residual errors shown above are instructive. When these errors are classified with respect to the magnitude of the measured distances upon which they depend there is found no marked relation of the one quantity to the other, i. e. the errors appear to be no greater for large distances than for small ones and this holds whether the anomalous results of November 3 are included in the comparison or are rejected from it. Thus, adopting as the basis of comparison the greatest of the four distances entering into the determination of a residual error and arranging the residuals in the order of magnitude of these distances I obtain the following:

TABLE XI. DISTRIBUTION OF ERRORS.

| Maximum Distance. | Error. |
|-------------------|--------|
| 43 | -0.06 |
| 96 | + .21 |
| 136 | + .19 |
| 143 | + .62 |
| 154 | + .12 |
| 179 | - .06 |
| 206 | - .15 |
| 286 | - .64 |
| 291 | + .17 |
| 374 | + .09 |

The average error in the first half of this table, i. e. for distances less than 160' is 0'.24 when taken without regard to sign, and the average error in the second half, for distances between 160' and 380', is 0'.22. Similar results are obtained when we adopt as the basis of comparison the mean of the four distances instead of the maximum distance entering into each residual. Thus for an average distance of 61' the mean of five residuals is 0'.23 and for an average distance of 211' the remaining five residuals also furnish as their mean value 0'.23. Corresponding to these numbers the average correction to be applied to a measured coordinate in order to adjust it to the rigorous condition above defined is 0'.06 and, so far as the forty observations which enter into the table are a sufficient criterion, the precision of the results is the same at all distances from 0' to 300'.

We may now summarize the contents of Table XII as follows:

Column 1 contains the date and the adopted mean temperature, the latter expressed in degrees Centigrade.

Column 2 shows the mean of the vernier readings corresponding to each setting of the position circle of the micrometer.

Column 3 shows the mean of the chronometer times of the four or more micrometer pointings that compose a set of observations. The chronometer corrections shown in Table II are still to be applied to these numbers in order to transform them into local sidereal times.

Column 4 contains the mean of the micrometer pointings composing a set. For the explanation of bracketed quantities, etc., see p. 19.

Column 5 contains the corrections for defective orientation of the threads, expressed in thousandths of a revolution of the screw. These are to be applied with their respective signs, not to the micrometer reading but to the coordinate derived from that reading.

Column 6 contains two different quantities, viz., the measured coordinate of the comparison star referred to the planet as origin, the + sign indicating that the star

is north or east of the planet; and in the following line, the refraction correction to this coordinate expressed in thousandths of a revolution of the screw.

Column 7 shows in its first line the coordinate of Column 6 corrected for refraction and expressed in seconds of arc. In the line following the coordinate there is given the corresponding parallax factor which is to be applied as explained above, p. 18.

Column 8 contains in its first line the Madison mean solar time corresponding to the coordinate of the preceding column. This has been derived in the customary way from the mean of the chronometer times given in Column 3. The second line of Column 8 contains a serial number representing the comparison star employed, followed by the approximate magnitude of the star as estimated at the telescope. The substitution of leaders,, in the place of these data indicates that the same star was used as in the preceding set.

Column 9 contains miscellaneous remarks that call for no special explanation.

TABLE XII. RESULTS OF THE EROS OBSERVATIONS.

| Date. Temp. | P. | Chron. | Microm- eter. | Parallel | Observ'd Coordi- nate. Re- fraction. | Adopted Coordi- nate. Parallax Factor. | Madi- son M. T. * Mag. | Remarks. |
|----------------|---------|--------------|------------------|----------|---|--|------------------------------|---------------------|
| 1900 | ° ' " | <i>h m s</i> | <i>r</i> | | <i>r</i> | <i>"</i> | <i>h m s</i> | |
| Sept. 30 | 95 33 | 20 20 0.3 | 35.664 | + 8 | +10.664 | 111.49 | 8 4 50.1 | |
| +14 C | 95 32.5 | 62 30.2 | 56.976 | + 9 | + 3 | +0.846 | 1, 10 | |
| | 5 26 | 20 31 19.5 | 42.067 | -38 | + 6.090 | 63 66 | 8 4 48.5 | |
| | 5 26 | 51 7.6 | 54.317 | -32 | + 1 | -1.269 | ..... |  |
| | 95 33 | 20 24 36.8 | 28.439 | -12 | -21.371 | 223.47 | 8 4 49.3 | |
| | 95 32.5 | 57 52.0 | 71.155 | -14 | - 8 | +0.846 | 2, 11.5 | |
| | 5 26 | 20 37 38.5 | 38 815 | +69 | - 9.426 | 98 52 | 8 5 3.6 | |
| | 5 26 | 45 19.1 | 57.810 | +73 | 0 | -1.270 | ..... |  |
| Oct. 2 | 95 35 | 20 30 40.7 | 44.146 | + 4 | + 2.362 | 24.67 | 8 6 7.5 | Micrometer reading |
| +17 C | 95 36 | 70 10.8 | 48.864 | + 2 | - 1 | +0.822 | 3, 10.2 | has been increased |
| | 5 29 | 20 39 56.8 | 42.294 | -10 | + 5.932 | 62.04 | 8 2 51.8 | 10 rev. |
| | 5 29 | 54 22.1 | 54.173 | - 4 | + 4 | -1.302 | ..... | Micrometer reading |
| | 95 35 | 20 34 43.4 | 27 467 | + 1 | +19.664 | 205.63 | 8 3 16.4 | has been diminished |
| | 95 36 | 60 25.1 | 66.793 | 0 | + 10 | +0.833 | 4, 8 6 | 1 rev. |
| | 5 29 | 20 44 15.5 | 47.259 | -49 | + 0.960 | 9 98 | 8 2 29.6 | B. D. 45, 655. |
| | 5 29 | 49 19.1 | 49 276 | -47 | - 6 | -1.303 | ..... |  |
| Oct. 8 | 96 1 | 20 35 22.2 | 16.253 | -10 | +29.604 | 309 57 | 7 54 55.6 | |
| +8 C | 96 3 | 91 15.8 | 75.487 | -15 | + 10 | +0.785 | 5, 9.5 | B. D. 47, 708. |
| | 5 59.5 | 20 56 19.2 | 38.747 | +17 | + 9.650 | 100.86 | 7 52 27.1 | |
| | 5 59.5 | 65 21.0 | 58.015 | +16 | - 1 | -1.393 | ..... |  |
| | 96 1 | 20 40 26.0 | 17.658 | - 5 | -32.623 | 341 19 | 7 54 13.8 | |
| | 96 3 | 84 48.2 | 82.904 | - 8 | - 15 | +0.788 | 6, 10.5 | |
| | 5 59.5 | 20 49 44.0 | 43.558 | -16 | + 4.934 | 51.71 | 7 54 21.9 | |
| | 5 59.5 | 75 46.5 | 53.461 | -19 | + 13 | -1.388 | ..... |  |
| Oct. 9 | 96 7 | 20 32 22.2 | 27.905 | +37 | -22.349 | 233 68 | 7 43 22.6 | |
| +11 C | 96 1.5 | 78 0 9 | 72.656 | +16 | - 6 | +0.840 | 7, 9.0 | B. D. 47, 703. |
| | 6 12 | 20 51 21.1 | 34.045 | -88 | -14.294 | 149 45 | 7 43 46.7 | |
| | 6 12 | 59 50.4 | 62.450 | -96 | - 4 | -1.409 | ..... |  |
| | 96 7 | 20 36 33.0 | 45.009 | -11 | + 1.714 | 17.92 | 7 43 2.2 | |
| | 96 1.5 | 73 9.4 | 48.452 | - 5 | 0 | +0.827 | 8, 11. | |
| | 6 12 | 20 42 56.8 | 44.168 | + 9 | + 4.320 | 45.17 | 7 42 55.3 | |
| | 6 12 | 66 31.5 | 52.794 | + 5 | + 2 | -1.409 | ..... |  |
| Oct. 9* | 96 0 | 21 55 37.4 | 76.591 | - 1 | +27.166 | 284.06 | 8 56 9.0 | |
| +11 C | 96 0.5 | 80 42.5 | 22.257 | - 1 | + 8 | +0.493 | 7, 9.0 | B. D. 47, 703. |
| | 6 6.5 | 22 6 5.8 | 49.199 | +71 | + 1.033 | 10.82 | 8 57 41.6 | |
| | 6 6.5 | 13 19.8 | 47.273 | +69 | - 2 | -1.311 | ..... |  |

4 OB.

TABLE XII—Continued.

| Date. Temp. | P. | Chron. | Microm- eter. | Parallel | Observ'd Coordi- nate. Re- fraction. | Adopted Coordi- nate. Parallax Factor. | Madi- son M. T. * Mag. | Remarks. |
|----------------|---------|--------------|------------------|----------|---|--|------------------------------|--|
| 1900 | | <i>h m s</i> | <i>r</i> | | <i>r</i> | <i>r</i> | <i>h m s</i> | |
| Oct. 10 | 96 5.5 | 20 25 35.2 | 45.091 | 0 | — 5.512 | 57.64 | 7 36 34.2 | |
| | 96 0 | 79 0.9 | 56.115 | 0 | — 2 | +0.834 | 9, 10.5 | |
| +11 C | ..... | 28 48 38.1 | 8 22.7 | ..... | — 0.148 | 1.53 | 7 35 44.9 | |
|  | ..... | 54 19.2 | 6 45.8 | ..... | + 2 | —1.427 | ..... |  |
| | 96 5.5 | 20 31 19.2 | 31.240 | —61 | +15.256 | 159.46 | 7 36 42.5 | |
| | 96 0 | 73 33.4 | 61 832 | —18 | — 1 | +0.833 | 10, 10.5 | |
| | 6 3 | 20 39 30.7 | 22.203 | +26 | +26.386 | 275.99 | 7 36 57.8 | |
| | 6 2 | 05 52.7 | 74.932 | +18 | + 16 | —1.425 | ..... |  |
| Oct. 11 | 96 9.5 | 20 11 55.8 | 59.231 | —107 | + 8.150 | 85.11 | 7 23 18.6 | |
| | 96 3 | 73 57.0 | 42.770 | —53 | — 7 | +0.879 | 11, 10 0 | |
| +11 C | 6 9.5 | 20 39 11.2 | 82 120 | +29 | +33.893 | 354.55 | 7 23 38.7 | |
| | 6 9.5 | 47 21.8 | 14.389 | +26 | + 24 | —1.444 | ..... |  |
| | 96 9.5 | 20 20 14.9 | 81.936 | —42 | —35.637 | 372 95 | 7 24 3.7 | |
| | 96 3 | 67 8.2 | 10.685 | —21 | — 21 | +0.875 | 12, 10.3 | |
| | 6 9.5 | 20 30 54.2 | 61.620 | —123 | +13.438 | 140 76 | 7 23 42.4 | |
| | 6 9.5 | 55 46.1 | 34.495 | —127 | + 28 | —1.442 | ..... |  |
| Oct. 12 | 96 4 | 21 4 0.5 | 54.403 | +37 | — 8.021 | 83.84 | 8 3 40.5 | |
| | 96 9 | 50 41.5 | 38.258 | +66 | — 0 | +0.669 | 13, 9. | B. D. 48, 758. |
| +13 C | 6 8.5 | 21 22 53.8 | 68 364 | —22 | —19.956 | 208.73 | 8 3 46.6 | |
| | 6 8.5 | 32 0.4 | 28.502 | —29 | — 12 | —1.430 | ..... | A loose screw in train of driving clock causes much delay. |
| | 96 4 | 21 8 5.6 | 69.235 | —10 | —22.406 | 235 24 | 8 3 1.8 | |
| | 96 9 | 45 18.6 | 24.274 | —20 | — 9 | +0.672 | 14, 9.5 | B. D. 48, 759. |
| | 6 8.5 | 21 15 34.9 | 53.942 | —68 | + 5.862 | 61 35 | 8 3 8.7 | |
| | 6 8.5 | 38 3.3 | 42.076 | —73 | + 8 | —1.430 | ..... |  |
| Oct. 13 | 96 16.5 | 20 1 39.5 | 62 326 | +57 | —15.926 | 166.53 | 6 57 46.6 | |
| | 96 16. | 48 45.2 | 30.362 | +55 | — 5 | +0.973 | 15, 10.6 | |
| +12 C | 6 15 | 20 23 13.3 | 58 771 | —76 | —10.416 | 108 91 | 6 59 27.5 | |
| | 6 15 | 30 34 0 | 38.100 | —86 | — 3 | —1.484 | ..... |  |
| | 96 16.5 | 20 7 33.3 | 59 269 | —25 | + 9.436 | 98.66 | 6 58 19.3 | |
| | 96 16 | 43 57.1 | 40.344 | —28 | + 3 | +0.970 | 16, 10.8 | |
| | 6 15 | 20 16 2.9 | 52.975 | +51 | + 4.999 | 52.26 | 6 59 10.1 | |
| | 6 15 | 37 9.6 | 43.072 | +44 | + 1 | —1.482 | ..... |  |
| Oct. 14 | 96 25 | 20 28 47.9 | 29.585 | +16 | +17.214 | 179 99 | 7 16 17.8 | |
| | 96 23 | 66 37.5 | 63.983 | +13 | + 7 | +0.862 | 17, 10. | |
| +14 C | 6 31 | 20 44 5.7 | 46.289 | +174 | — 1.746 | 18.31 | 7 16 16.7 | |
| | 6 31 | 51 17.4 | 50 115 | +159 | — 6 | —1.501 | ..... |  |
| | 96 25 | 20 32 20 0 | 47.295 | —43 | — 2 266 | 23.71 | 7 16 4.6 | |
| | 96 23 | 62 38 8 | 51.741 | —44 | — 3 | +0.863 | 18, 11. | |

TABLE XII—Continued.

| Date. Temp. | P. | Chron. | Microm- eter. | Parallel | Observ'd Coordi- nate. Re- fraction. | Adopted Coordi- nate. Parallax Factor. | Madi- son M. T. * Mag. | Remarks. |
|----------------|-------------------|-----------------------|------------------|--------------|---|---|------------------------------|---|
| 1900 | ° ' " | h m s | r | | r | " | h m s | |
| Oct. 14 | 6 31 6 31 | 20 37 57.5 56 57.6 | 42.899 54.149 | -16 -27 | + 5.604 + 5 | 58 62 -1.500 | 7 16 2 8 | |
| Oct. 15 | 96 4 5 96 21.5 | 20 22 36.0 80 12.9 | 57.091 34.806 | +199 +237 | -10.924 - 6 | 114.23 +0.839 | 7 16 3.4 19, 10.2 | A bad night, sheet lightning, passing clouds. Star images are woolly. |
| +18 C | 6 20 6 20 | 20 49 5.6 55 43 5 | 55 109 41.259 | +314 +340 | + 7.252 + 8 | 75 88 -1.510 | 7 17 3.4 | |
| | 96 4.5 96 21.5 | 20 36 30.3 74 55.1 | 67 108 32 581 | -740 -596 | +16.596 + 13 | 173 59 +0.818 | 7 20 21.0 20, 10. | |
| | 6 20 6 20 | 20 43 11.7 64 27.3 | 69 846 27.445 | -524 -486 | -21.706 - 20 | 227.12 -1.507 | 7 18 28.1 | |
| Oct. 16 | 97 44 97 44.5 | 20 9 48.9 68 2.1 | 46.116 55.031 | +120 +127 | - 4.334 - 10 | 45 42 +0.903 | 6 59 41.1 21, 8.5 | B. D. 49°, 760 |
| +6 C | 7 47 7 47 | 20 32 21.8 43 41.2 | 22 949 74.033 | +16 +19 | +25.559 + 22 | 267 42 -1.530 | 6 58 47.2 | |
| | 97 44 97 44.5 | 20 16 59.0 60 46.0 | 34 650 58.536 | -35 -27 | +11.912 + 8 | 124.61 +0.903 | 6 59 38 1 22, 11. | |
| | 7 47 7 47 | 20 24 32.4 54 43.7 | 41.407 54.167 | -52 -43 | - 6.428 - 9 | 67.30 -1.527 | 7 0 23.4 | |
| Oct. 17 | 98 5.5 98 5.5 | 20 50 21.2 70 38.6 | 67.425 27.567 | + 4 + 3 | -19.926 - 7 | 208.38 +0.788 | 7 17 16.0 23, 10. | |
| +6 C | 8 3 8 3 | 20 57 38.2 64 11.2 | 51.318 45.535 | -13 -13 | - 2.904 + 3 | 30.39 -1.538 | 7 17 40.7 | |
| Oct. 18 | 98 3 98 2 | 20 34 38.5 94 22.1 | 32.579 68.480 | + 4 + 2 | -17.948 - 6 | 187.67 +0.770 | 7 17 20.1 24, 9.5 | |
| +11 C | 8 2 8 2 | 20 58 44.4 66 46 0 | 42.525 53.728 | - 6 - 7 | - 5.608 0 | 58.62 -1.562 | 7 15 35.2 | |
| | 98 3 98 2 | 20 39 50.4 90 45.6 | 25.337 67.404 | +15 + 8 | +21.045 + 13 | 220 13 +0 765 | 9 18 7.6 25, 10.5 | |
| | 8 2 8 2 | 20 50 9.7 84 19.1 | 24.408 70.774 | + 8 + 7 | -23.176 - 20 | 242 47 -1.554 | 7 20 3.7 | Whole revolution doubtful. |
| Oct. 19 | 98 3 98 0 | 20 16 59.4 60 41 5 | 27.344 72.431 | - 6 + 2 | -22.546 - 13 | 235.91 +0.897 | 6 46 44.1 26, 10.3 | |
| +11 C | 8 3 8 3 | 20 34 42.5 42 55.2 | 38.598 58.402 | -14 -15 | + 9.888 + 14 | 103 51 -1.579 | 6 47 47.1 | |
| | 98 3 98 0 | 20 21 41.2 56 4.4 | 26.648 67.392 | + 1 0 | +20.372 + 9 | 213.05 +0.897 | 6 47 51.1 27, 11. | |
| | 8 3 8 3 | 20 28 34.2 49 4.5 | 46.606 49.212 | +13 +13 | - 1.290 - 7 | 13 55 -1.577 | 6 47 47.7 | |

TABLE XII—Continued.

| Date. Temp. | P. | Chron. | Microm- eter. | Parallel | Obsery'd Coordi- nate. Re- fraction. | Adopted Coordi- nate. Parallax Factor. | Madi- son M. T. * Mag. | Remarks. |
|----------------|---------|--------------|-----------------------------|----------|---|--|------------------------------|---|
| 1900 | | <i>h m s</i> | <i>r</i> | | <i>r</i> | <i>s</i> | <i>h m s</i> | |
| Oct. 20 | 98 4 | 21 28 33.1 | 62.967 | 0 | +13.874 | 145.05 | 7 44 33.9 | Through break in clouds. Good see- ing. |
| | 98 4 | 50 49.2 | 35.219 | 0 | + | +0 568 | 28, 9.3 | |
| +13 C | ..... | 21 35 3.4 | 8 32.0 | 0 | + 0 308 | 3.22 | 7 43 37.4 | |
| | 8 1.5 | 42 25.8 | [0.481] | + 3 | 0 | -1.532 | | |
| Oct. 25 | 97 59 | 20 33 48.5 | 56.848 | - 4 | - 9.882 | 103.30 | 6 42 13.7 | Stars occasionally faint, through clouds. |
| | 98 4 | 79 57.8 | 37.082 | + 6 | - | +0.776 | 29, 10.5 | |
| +17 C | 7 54.5 | 20 54 1.2 | 55.855 | +16 | - 6.848 | 71.58 | 6 42 39.7 | |
| | 7 54.5 | 60 37.4 | 42.122 | +20 | - | -1.670 | ..... |  |
| | 97 59 | 20 38 3.1 | 58.486 | +12 | + 9 127 | 95.39 | 6 42 13.3 | |
| | 98 4 | 75 42.5 | 40.223 | -21 | - | +0.777 | 30, 9.5 | |
| | 7 54.5 | 20 46 10.8 | 70.483 | -18 | +22.796 | 238.39 | 6 42 20.5 | |
| | 7 54.5 | 67 49.3 | 24.857 | -15 | + | -1.669 | ..... |  |
| Oct. 26 | 97 56 | 20 48 15.9 | 44 714 | +34 | - 4.728 | 49.47 | 6 50 47.9 | B. D. 53, 513 |
| | 97 56.5 | 90 34.6 | 54.235 | +31 | - | +0 693 | 31, 10. | |
| +14 C | 7 52 | 21 7 33.4 | 23.049 | +10 | +25.483 | 266.55 | 6 52 31.1 | |
| | 7 52 | 14 44.0 | 73.992 | +13 | + | -1.670 | ..... |  |
| | 97 56 | 20 52 3.9 | 38.703 | - 9 | + 8.621 | 90 15 | 6 50 53.3 | |
| | 97 56.5 | 86 57.4 | 55.960 | - 5 | + | +0.693 | 32, 10.5 | |
| | 7 52 | 20 58 30.3 | 42.091 | -23 | - 5 578 | 58.34 | 6 51 12.8 | |
| | 7 52 | 81 10.2 | 53.203 | -20 | - | -1.670 | ..... |  |
| Nov. 1 | 97 53 | 20 47 53.6 | 68 532 | - 2 | -20.956 | 219 14 | 6 25 46.5 | B. D. 53, 503. |
| | 97 51 | 88 4.8 | 26.623 | - 1 | - | +0 650 | 33, 8.5 | |
| +7 C | 7 52.5 | 21 6 20.2 | 49.272 | +49 | - 0.741 | 7.73 | 6 26 28.8 | |
| | 7 52.5 | 11 3.1 | 47.690 | +51 | + | -1.756 | ..... |  |
| | 97 53 | 20 53 35.7 | 71 819 | -23 | +22.985 | 240.36 | 6 26 14.2 | |
| | 97 51 | 83 18.2 | 25 803 | -23 | + | +0.647 | 34, 10.5 | |
| | 7 52.5 | 21 1 25.6 | 57.903 | -55 | - 9.159 | 95 83 | 6 26 35.4 | |
| | 7 52.5 | 16 10.8 | 39.694 | -54 | - | -1.755 | ..... |  |
| Nov. 2 | 97 57 | 20 38 19.6 | 24.676 | -11 | -24.474 | 255 89 | 6 18 6.8 | Four measurements of position angle fol- lowed by three mi- crometer settings. B. D. 53, 493. |
| | 98 0 | 90 10.2 | 73.611 | - 3 | - | +0.665 | 35, 9.5 | |
| +10 C | 7 53.5 | 20 56 59.9 | 34.946 | +50 | -13.133 | 137.33 | 6 13 50.4 | |
| | 7 53.5 | 62 55.7 | 61.314 | +52 | - | -1.784 | ..... |  |
| | 97 57 | 20 42 59.0 | 13.433 | - 1 | +34.187 | 357.48 | 6 18 14.5 | |
| | 98 0 | 85 46.2 | 81.808 | 0 | + | +0.667 | 36, 10.0 | |
| | 7 53.5 | 20 51 5.5 | 46.979 | -72 | - 0.506 | 5.33 | 6 17 51.1 | |
| | 7 53.5 | 76 52.8 | 8 ^{22.5} 48.862 | -71 | - | -1.775 | ..... |  |
| Nov. 3 | 97 57.5 | 20 13 13.8 | [12.902] | 0 | +12.306 | 128.67 | 5 44 9.1 | B. D. 53, 493. |
| | 97 57.5 | 55 2.8 | [11.710] | 0 | + | +0.847 | 37, 9.5 | |

TABLE XII—Continued.

| Date. Temp. | P. | Chron. | Microm- eter. | Parallel | Observ'd Coordi- nate. Re- fraction. | Adopted Coordi- nate. Parallax Factor. | Madi- son M. T. * Mag. | Remarks. |
|----------------|---------|--------------|------------------|----------|---|--|------------------------------|--|
| 1900 | | <i>h m s</i> | <i>r</i> | | <i>r</i> | <i>"</i> | <i>h m s</i> | |
| Nov. 3 | 7 54 | 20 32 37.9 | 48.834 | -25 | - 0.410 | 4 31 | 5 45 9.4 | |
| | 7 54 | 37 39 6 | 48.062 | -23 | - 2 | -1.830 | ..... |  |
| +12 C | 97 57.5 | 20 19 54.8 | 71.646 | + 2 | -23.802 | 248.90 | 5 45 11.3 | |
| | 97 57.5 | 50 26.6 | 24.037 | + 4 | - 9 | +0.841 | 38, 9.8 | B. D. 53, 494. |
| | 7 54 | 20 27 8.7 | 51.150 | +46 | + 3.467 | 36 30 | 5 45 28.7 | |
| | 7 54 | 43 47.5 | 44.308 | +47 | + 6 | -1.829 | ..... |  |
| Nov. 3* | 97 55 | 22 20 21.1 | 57.677 | +13 | + 8.862 | 92 66 | 7 49 5.0 | |
| | 97 58 | 58 28.5 | 39.974 | + 7 | + 2 | +0.102 | 37, 9.5 | B. D. 53, 493. |
| +12 C | 7 54.5 | 22 37 8.0 | 56.701 | -16 | + 8 576 | 89 69 | 7 49 24.6 | |
| | 7 54 5 | 42 20.8 | 39.518 | -14 | + 4 | -1.463 | ..... |  |
| | 97 55 | 22 23 42.4 | 75.167 | +17 | -27.278 | 285.21 | 7 48 51.6 | |
| | 97 58 | 54 40.1 | 20.584 | +10 | - 7 | +0 102 | 38, 9.8 | B. D. 53, 494. |
| | 7 54.5 | 22 30 53.9 | 60.077 | +48 | +12.480 | 130.50 | 7 49 11.0 | |
| | 7 54.5 | 48 7.6 | 35.213 | +49 | + 5 | -1.463 | ..... |  |
| Nov. 4 | 97 58.5 | 21 10 28.2 | 45.698 | + 9 | + 2.078 | 21.72 | 6 38 8.9 | |
| | 97 56.5 | 53 59.0 | 49.828 | +18 | 0 | +0.466 | 39, 10.5 | |
| +9 C | 7 57 | 21 28 14.9 | 34.469 | - 3 | +14.052 | 146.97 | 6 37 30.5 | |
| | 7 57 | 34 55.3 | 62.577 | - 2 | + 7 | -1.734 | ..... |  |
| | 97 58.5 | 21 14 0.0 | 41.566 | -17 | - 7.169 | 74 94 | 6 37 7.4 | |
| | 97 56.5 | 48 44.0 | 55.858 | -29 | 0 | +0.470 | 40, 9.3 | Not in B. D. |
| | 7 57 | 21 21 28.2 | 22.928 | + 7 | -24.684 | 258.17 | 6 37 30.0 | |
| | 7 57 | 41 41.1 | 72.312 | + 8 | - 13 | -1.732 | ..... |  |
| Nov. 5 | 98 1 5 | 20 27 54.8 | 65.654 | + 7 | -17.824 | 186 36 | 5 54 37.0 | |
| | 98 4 | 77 7.6 | 29.971 | +28 | - 2 | +0.713 | 41, 10. | |
| +5 C | 7 55 | 20 50 57.2 | 77.549 | +29 | -28.896 | 302.26 | 5 56 57.4 | |
| | 7 55 | 58 46.7 | 19.698 | +30 | - 16 | -1.832 | ..... |  |
| | 98 1.5 | 20 34 14.2 | 84.144 | - 4 | +35.482 | 371 05 | 5 55 19.6 | |
| | 98 4 | 72 13 9 | 13.157 | -18 | + 10 | +0.707 | 42, 11. | |
| | 7 55 | 20 43 3.0 | 65.970 | -59 | +18.216 | 190.50 | 5 56 13.5 | |
| | 7 55 | 65 12 9 | 29.421 | -59 | + 6 | -1.832 | ..... |  |
| Nov. 8 | 98 0.5 | 20 45 22.9 | 53.136 | - 1 | + 4.636 | 48.48 | 5 55 39.4 | |
| | 98 0.5 | 85 25 2 | 43.863 | - 1 | + 2 | +0.603 | 43, 11. | A raw, blustering night. Images fairly steady. |
| -1 C | 7 56.5 | 21 2 22.0 | 52.792 | - 7 | - 4.218 | 44.13 | 5 56 24.7 | |
| | 7 56.5 | 9 56 9 | 44.369 | - 7 | - 3 | -1.843 | ..... |  |
| | 98 0.5 | 20 49 1.0 | 50.816 | 0 | - 2.634 | 27.24 | 5 55 56.7 | |
| | 98 0.5 | 82 21.8 | 45.547 | + 1 | - 1 | +0.600 | 44, 11.1 | |
| | 7 56.5 | 20 55 42.7 | 50.918 | - 4 | + 3.353 | 35.07 | 5 56 8.6 | |
| | 7 56.5 | 76 3.9 | 44.204 | - 4 | + 2 | -1.842 | ..... |  |

TABLE XII.—Continued.

| Date. Temp. | P. | Chron. | Microm- eter. | Parallel | Observ'd Coordinate. Refraction. | Adopted Coordinate. Parallax Factor. | Madi- son M. T. * Mag. | Remarks. |
|----------------|---------|------------|------------------|----------|--|---|------------------------------|---|
| 1900 | ° ' " | h m s | r | | r | " | h m s | |
| Nov. 8* | 98 3 | 23 1 37.4 | 52.056 | - 2 | + 3.582 | 37.45 | 8 13 56.9 | |
| -2 C | 97 57 | 46 31.1 | 44.899 | + 9 | + 1 | -0.170 | 43, 11. | |
| | 7 57.5 | 23 18 18.3 | 54.073 | - 4 | + 6.049 | 63.26 | 8 12 12.7 | |
| | 7 57.5 | 26 21.2 | 41.968 | - 3 | + 2 | -1.219 | ..... |  |
| | 98 3 | 23 4 58.6 | 51.864 | - 6 | - 3.663 | 38.30 | 8 13 59.6 | |
| | 97 57 | 43 15.2 | 44.525 | +19 | - 1 | -0.172 | 44, 11.1 | |
| | 7 57.5 | 23 11 23.2 | 61.139 | + 4 | +13.660 | 142.86 | 8 12 18.3 | |
| | 7 57.5 | 33 27.5 | 33.828 | + 4 | + 5 | -1.217 | ..... |  |
| Nov. 11 | 98 4 | 20 57 55.9 | 51.845 | - 5 | - 3.450 | 38.07 | 6 1 1.1 | Cloudy all day. At- mospheric conditions good after disappear- ance of clouds. |
| -2 C | 97 57.5 | 107 18.6 | 44.941 | + 9 | - 1 | +0.465 | 45, 9.5 | |
| | 8 0 | 21 21 35.4 | 55.367 | + 1 | + 7.288 | 76.31 | 6 3 18.7 | |
| | 8 0 | 28 14.9 | 40.794 | + 1 | + 4 | -1.816 | ..... |  |
| | 98 4 | 21 6 55.5 | 63.781 | -12 | +15 512 | 162.23 | 6 3 32.3 | |
| | 97 57.5 | 43 22.2 | 32.767 | +21 | + 4 | +0.448 | 46, 9.5 | |
| | 8 0 | 21 14 34.2 | 65.134 | - 6 | +17.576 | 183.86 | 6 3 46.5 | |
| | 8 0 | 36 12.0 | 29.968 | - 7 | + 8 | -1.812 | ..... |  |
| Nov. 15 | 98 3 | 20 53 47.8 | 10.701 | - 3 | -37.153 | 388.62 | 5 41 16.9 | |
| -10 C | 98 2 | 103 27.1 | 85.003 | - 1 | - 11 | +0.464 | 47, 9.5 | |
| | 8 0.5 | 21 15 41.7 | 42.054 | +10 | + 6.506 | 68.10 | 5 42 25.7 | |
| | 8 0.5 | 23 51.0 | 55.047 | +10 | + 6 | -1.861 | ..... |  |
| | 98 3 | 20 59 30.3 | 26.911 | + 5 | +21.801 | 228.07 | 5 41 46.7 | |
| | 98 2 | 98 44.0 | 70.506 | + 2 | + 8 | +0.460 | 48, 11.5 | |
| | 8 0.5 | 21 7 47.9 | 36.915 | - 6 | -10.520 | 110.08 | 5 42 50.3 | |
| | 8 0.5 | 32 34.2 | 57.942 | - 6 | - 7 | -1.857 | ..... |  |
| Nov. 15* | 98 0.5 | 23 38 35.8 | 73.125 | 0 | +25.093 | 262.49 | 8 14 55.4 | |
| -10 C | 98 0.5 | 66 46.4 | 22.939 | 0 | + 8 | -0.338 | 48, 11.5 | |
| | 7 59.5 | 23 53 27.4 | [0.275] | -13 | + 0.249 | 2.67 | 8 15 56.7 | |
| | 7 59.5 | 53 57.9 | [0.250] | -14 | + 6 | -0.955 | ..... |  |
| Nov. 21 | 98 2.5 | 21 6 59.7 | [6.742] | -18 | - 5.862 | 61.32 | 5 27 18.2 | |
| -3 C | 98 2.5 | 49 37.6 | [4.946] | -19 | - 3 | +0.382 | 49, 9.5 | A fairly good night. |
| | 8 1.5 | 21 19 49.4 | 70.656 | - 3 | +22.850 | 239.03 | 5 27 37.7 | |
| | 8 1.5 | 37 26.8 | 24.951 | - 2 | + 11 | -1.858 | ..... |  |
| Nov. 22 | 98 3 | 22 25 32.0 | 53.117 | - 4 | + 5.634 | 58.93 | 6 37 23.0 | |
| -2 C | 98 3 | 59 31.6 | 41.839 | - 5 | + 2 | -0.044 | 50, 9.0 | B. D. 52, 406. |
| | 8 3 | 22 34 51.8 | 52.775 | + 5 | + 4.931 | 51.57 | 6 37 32.3 | Clouds prevent earlier observation. |
| | 8 3 | 50 30.4 | 42.924 | + 6 | + 2 | -1.444 | ..... |  |
| | 98 3.5 | 12 28 36.8 | 59.092 | + 1 | +11.486 | 120.12 | 6 37 15.2 | |
| | 98 3.5 | 56 11.1 | 36.122 | + 1 | + 3 | -0.045 | 51, 9.5 | B. D. 52, 405. |

TABLE XII—Continued.

| Date. Temp. | P. | Chron. | Microm- eter. | Parallel | Obsery'd Coordi- nate. Re- fraction. | Adopted Coordi- nate. Parallax Factor. | Madi- son M. T. * Mag. | Remarks. |
|----------------|------------------|-----------------------|----------------------|------------|---|--|------------------------------|---|
| 1900 | | | | | | | | |
| Nov. 22 | 8 3 8 3 | 22 40 21.2 45 48.8 | 49.309 47 561 | +10 +11 | - 0.864 0 | 9 03 -1.442 | 6 37 56.1 | |
| Nov. 23 | 97 59 98 0.5 | 23 7 25.8 51 10.5 | 71.321 23.047 | + 8 - 6 | +24.138 + 7 | 252.46 -0.245 | 7 20 5.9 | Clouds prevent earlier observation. |
| -2 C | 7 59.5 7 59.5 | 23 22 35.2 30 51.2 | 79.778 16 563 | - 2 - 2 | +31.606 + 11 | 330.58 -1.116 | 7 17 31.3 | |
| | 97 59 98 0.5 | 23 10 36.5 44 13.3 | 51.435 43.462 | - 2 + 2 | + 3.986 + 1 | 41.09 -0.241 | 7 18 12.9 | |
| | 7 59.5 7 59.5 | 23 15 45.8 37 34.5 | 58.154 39.656 | 0 0 | - 9.249 - 3 | 96.73 -1.116 | 7 17 28.3 | |
| Nov. 25 | 98 2.5 98 3 | 21 16 30.7 67 20.0 | [3 719] [0.869] | -17 -21 | - 2.313 - 2 | 24.20 +0.313 | 5 25 8.0 | |
| -1 C | 8 0.5 8 0.5 | 24 38 20.0 46 13.8 | 27.293 69.670 | - 1 0 | +21.188 + 11 | 221.64 -1.810 | 5 25 29.4 | |
| | 98 2.5 98 3 | 21 21 41.1 62 7.7 | [10.130] [7.905] | +24 +26 | - 8 992 - 2 | 94.04 +0.311 | 5 25 7.0 | B. D. 51, 344. |
| | 8 0.5 8 0.5 | 21 31 22.8 53 30.0 | 19.117 76.637 | - 2 - 2 | -28.762 - 13 | 300.82 -1.807 | 5 25 38.9 | |
| Nov. 25* | 98 3.5 98 4 | 23 36 22.8 77 33.5 | 52.609 41.542 | -28 -34 | + 5.502 + 2 | 57.55 -0.326 | 7 39 48.7 | |
| -1 C | 7 58 7 58 | 23 52 23.2 59 41.8 | 75.309 20.999 | - 2 - 3 | +27.152 + 8 | 283.97 -0.865 | 7 38 53.1 | |
| | 98 3.5 98 4 | 23 39 51.0 73 13.2 | 50.543 48.129 | +25 +27 | - 1.181 0 | 12.35 -0.327 | 7 39 22.6 | B. D. 51, 344. |
| | 7 58 7 58 | 23 46 7.9 65 31.8 | 71.575 25.965 | + 1 0 | -22.805 - 7 | 238.51 -0.866 | 7 38 40.5 | |
| Nov. 26 | 98 0.5 98 1.5 | 21 26 13.0 67 2.2 | [31.260] [28.873] | - 3 - 6 | -30.071 - 9 | 314.52 +0.286 | 5 25 53.5 | B. D. 51, 341. |
| -3 C | 8 1 8 1 | 21 42 48.5 51 24.3 | 35.793 61.145 | -10 -10 | +12.606 + 5 | 132.48 -1.788 | 5 26 22.2 | |
| | 98 0.5 98 1.5 | 21 26 8.2 67 12.2 | [26.211] [28.724] | - 3 - 7 | +27.462 + 8 | 287.22 +0.286 | 5 25 56.1 | B. D. 51, 342. |
| | 8 1 8 1 | 21 36 14.3 58 43.8 | 35.260 62.349 | + 9 +10 | +13.554 + 3 | 141.75 -1.784 | 5 26 44.8 | |
| Nov. 26* | 98 1.5 98 4 | 23 40 57.5 82 37.0 | 76.497 27.810 | - 9 -22 | -21.859 - 6 | 228.62 -0.331 | 7 40 41.0 | B. D. 51, 341. |
| -3 C | 7 58.5 7 58.5 | 23 56 22.8 62 33.0 | 66.341 30.039 | + 8 + 8 | +18.159 + 6 | 189.93 -0.831 | 7 38 22.1 | Stars woolly and bi- sections uncertain. |

TABLE XII—Continued.

| Date. Temp. | P. | Chron. | Microm- eter. | Parallel | Obsery'd Coordi- nate. Re- fraction. | Adopted Coordi- nate. Parallax Factor. | Madi- son M. T. * Mag. | Remarks. |
|----------------|---------------------------|--|------------------|----------|---|--|--|------------------------------------|
| | ^o ['] | ^h ^m ^s | ^r | | ^r | ["] | ^h ^m ^s | |
| 1900 | | | | | | | | |
| Nov. 26* | 98 1.5 | 23 44 5.2 | 82.918 | - 9 | +35.591 | 372.23 | 7 39 16.1 | |
| | 98 4 | 76 38.8 | 11.703 | -24 | + 10 | -0.330 | 57, 9.5 | B. D. 51, 342. |
| | 7 58 5 | 23 50 13.0 | 66.999 | -13 | +19.035 | 199.09 | 7 38 49.2 | Distance too great to |
| | 7 58.5 | 69 37 2 | 28.902 | -14 | + 6 | -0.826 | ..... | be well measured. |
| Nov. 27 | 97 59.5 | 21 12 45.7 | [14.272] | - 2 | +14.835 | 155.16 | 4 57 23.8 | |
| | 97 58.5 | 31 15.2 | [15.408] | - 8 | + 5 | +0.447 | 58, 7.5 | B. D. 51, 338. |
| -1 C | 8 1 | 21 20 40.0 | 26.189 | + 5 | -22.030 | 230.46 | 4 58 36.3 | |
| | 8 1 | 25 45.9 | 70.260 | + 5 | - 12 | -1.910 | ..... |  |
| | 97 58.5 | 21 37 8.8 | 34.651 | + 4 | -13.049 | 136.48 | 5 22 32.2 | |
| | 98 0 | 57 17.0 | 60.752 | - 1 | - 5 | +0.288 | 59, 10.5 | |
| | 8 2 | 21 44 48.8 | 37.714 | - 8 | +10.698 | 111.91 | 5 23 25.6 | |
| | 8 2 | 51 23.9 | 59.125 | - 8 | + 6 | -1.786 | ..... |  |
| Nov. 29 | 98 0.5 | 21 27 3.8 | [1.120] | - 1 | + 2.536 | 26.52 | 5 15 14.9 | |
| | 98 2.5 | 68 32.4 | [3.959] | - 5 | + 1 | +0.304 | 60, 9.5 | B. D. 50, 305. |
| -1 C | 7 58 | 21 39 45.2 | 54.421 | - 1 | + 6.342 | 66.34 | 5 15 44.1 | |
| | 7 58 | 56 49.5 | 41.733 | - 2 | + 3 | -1.793 | ..... | Good. |
| | 98 0.5 | 21 32 36.2 | [10.251] | - 2 | - 9.217 | 96.40 | 5 15 48.3 | |
| | 98 2.5 | 64 6.9 | [8.171] | -10 | - 3 | +0.300 | 61, 9.8 | |
| | 7 58 | 21 45 2.7 | 60.371 | + 5 | +12.121 | 126.78 | 5 15 35.9 | |
| | 7 58 | 51 15.5 | 36.139 | + 5 | + 5 | -1.795 | ..... |  |
| Nov. 29* | 97 59 | 0 1 11.9 | 60.057 | + 2 | +12.790 | 133.77 | 7 42 59.9 | |
| | 97 56.5 | 30 42.8 | 34.488 | +10 | + 4 | -0.338 | 60, 9.5 | B. D. 50, 305. |
| -2 C | 7 57.5 | 0 12 6.9 | 59.033 | - 8 | +10.762 | 112.53 | 7 42 12.1 | Good. |
| | 7 57.5 | 18 11.9 | 37.491 | - 9 | + 3 | -0.681 | ..... |  |
| | 97 59 | 23 58 13.8 | -48.591 | + 4 | + 1.074 | 11.23 | 7 43 44.9 | |
| | 97 56.5 | 95 11.2 | +45.940 | +16 | 0 | -0.338 | 61, 9.8 | |
| | 7 57.5 | 0 6 44.3 | 64.619 | 0 | +16.540 | 172.99 | 7 42 16.5 | |
| | 7 57.5 | 23 43.3 | 31.538 | - 1 | + 5 | -0.680 | ..... |  |
| Dec. 5 | 98 0 | 22 17 48.5 | 52.213 | 0 | - 2.476 | 25.89 | 5 38 44.5 | |
| | 98 0 | 52 16.4 | 47.262 | 0 | - 1 | +0.128 | 62, 9.5 | B. D. 48, 458. |
| -1 C | 7 59 | 22 30 53.3 | 50.378 | + 1 | - 2.049 | 21.43 | 5 37 33.1 | Dup. 300°, 3', 11.5m. |
| | 7 59 | 36 48.4 | 46.279 | 0 | - 1 | -1.532 | ..... |  |
| | 98 0 | 22 21 15.2 | 54.939 | - 1 | - 4.988 | 52.17 | 5 38 58.4 | |
| | 98 0 | 49 17.6 | 44.966 | - 1 | - 2 | +0.126 | 63, 9. | B. D. 48, 459. |
| | 7 59 | 22 26 17.8 | 61.233 | + 1 | +12.944 | 135.39 | 5 38 25.9 | |
| | 7 79 | 43 9.7 | 35.348 | + 1 | + 5 | -1.525 | ..... |  |
| Dec. 8 | 97 59.5 | 22 29 38.1 | 36.115 | - 1 | -10.457 | 109.36 | 5 41 35.2 | |
| | 97 59 | 69 50.0 | 57.029 | + 1 | - 3 | +0.111 | 64, 10.5 | Stars very faint, through haze. |

TABLE XII—Continued.

| Date. Temp. | P. | Chron. | | | Microm- eter. | Parallel | Obsery'd Coordi- nate. Re- fraction. | Adopted Coordinate. Parallax Factor. | Madi- son M. T. * Mag. | | | Remarks. |
|----------------|---------|--------------|--------------|--------------|------------------|----------|---|---|------------------------------|--------------|--------------|--|
| 1900 | ° ' " | ^h | ^m | ^s | ^r | | ^r | ^r | ^h | ^m | ^s | |
| Dec. 8 | 7 59.5 | 22 | 39 | 36.8 | [5.845] | + 1 | - 5.917 | 61.88 | 5 | 41 | 24.8 | |
| +2 C | 7 59.5 | | 59 | 30.3 | [5.990] | + 1 | - 2 | -1.432 | ..... |  |  |  |
| | 97 59.5 | 22 | 32 | 39.0 | 41.692 | 0 | + 8.108 | 84.79 | 5 | 41 | 27.6 | |
| | 97 59 | | 66 | 33.8 | 57.908 | 0 | + 2 | +0.110 | 65, 11.5 | | | |
|  | ..... | 22 | 46 | 9.2 | 8 55 7 | ..... | + 0.132 | 1.38 | 5 | 40 | 37.7 | |
|  | ..... |  | 51 | 23.5 | 8 55.7 | ..... | 0 | -1.439 | ..... |  |  |  |
| Dec. 9 | 97 59.5 | 22 | 9 | 0.7 | [16.802] | + 3 | -14.562 | 152.33 | 5 | 23 | 10.4 | |
| -11 C | 98 0.5 | | 61 | 23.3 | [12.316] | - 8 | - 4 | +0.204 | 66, 9. | | | Not in B. D. |
| | 8 2 | 22 | 20 | 15.7 | 10.170 | -11 | +37.915 | 396.64 | 5 | 24 | 35.1 | |
| | 8 2.5 | | 52 | 58.1 | 86.020 | -10 | + 15 | -1.532 | ..... |  |  |  |
| | 97 59 | 22 | 34 | 2.4 | 41.713 | - 1 | + 6.786 | 70.99 | 5 | 23 | 52.6 | |
| | 97 59 | | 37 | 46.2 | 55.288 | - 1 | + 2 | +0.193 | 67, 11. | | | |
| | 8 2 | 22 | 27 | 47.7 | 43.570 | + 4 | - 4.870 | 50.94 | 5 | 24 | 26.9 | |
| | 8 2.5 | | 45 | 9.7 | 53.319 | + 5 | - 2 | -1.536 | ..... |  |  |  |
| Dec. 9* | 98 2.5 | 0 | 20 | 38.8 | 64.406 | + 5 | +17.108 | 178.95 | 7 | 19 | 52.6 | |
| -12 C | 98 0 | | 43 | 48.0 | 30.195 | 0 | + 5 | -0.134 | 67, 11. | | | Awkward and con- strained position for observer. |
| | 7 57 | 0 | 27 | 30.6 | 54.566 | -13 | - 6.272 | 65.61 | 7 | 18 | 50.1 | |
| | 7 57 | | 34 | 50.8 | 42.048 | -14 | - 2 | -0.544 | ..... |  |  |  |
| Dec. 10 | 98 1 | 22 | 20 | 43.6 | 39.380 | - 1 | +10.478 | 109.60 | 5 | 21 | 47.5 | |
| -8 C | 97 59.5 | | 54 | 47.0 | 60.336 | 0 | + 3 | +0.210 | 68, 10.0 | | | |
| | 8 0 | 22 | 30 | 56.8 | 45.394 | + 1 | + 2.820 | 29.49 | 5 | 22 | 34.2 | |
| | 8 0 | | 46 | 7.4 | 51.032 | + 1 | + 1 | -1.529 | ..... |  |  |  |
| | 98 1 | 22 | 24 | 23.4 | 38.687 | - 1 | - 8.444 | 88.32 | 5 | 21 | 51.4 | |
| | 97 59.5 | | 51 | 15.0 | 55.573 | 0 | - 3 | +0.207 | 69, 10.2 | | | |
| | 8 0 | 22 | 36 | 5.8 | 45.900 | - 1 | + 2.380 | 24.89 | 5 | 22 | 33.1 | |
| | 8 0 | | 40 | 57.2 | 50.660 | 0 | + 1 | -1.530 | ..... |  |  |  |
| Dec. 11 | 98 0 | 22 | 24 | 58.0 | -45.498 | + 2 | - 1.187 | 12.41 | 5 | 23 | 29.3 | |
| -10 C | 98 2 | | 61 | 49.8 | +48.766 | +20 | 0 | +0.204 | 70, 10.0 | | | B. D. 46, 384. |
| | 8 0.5 | 22 | 38 | 59.0 | 17.101 | - 1 | -31.317 | 327.61 | 5 | 22 | 51.6 | |
| | 8 0.5 | | 46 | 33.2 | 79.734 | 0 | - 12 | -1.507 | ..... |  |  |  |
| | 98 0 | 22 | 28 | 57.5 | 46.807 | 0 | + 2.844 | 29.74 | 5 | 23 | 39.9 | |
| | 98 2 | | 58 | 11.6 | 52.494 | + 1 | + 1 | +0.201 | 71, 10.2 | | | Dup. 87°, 3', 12 m. |
| | 8 0.5 | 22 | 33 | 24.9 | 46.947 | 0 | - 1.586 | 16.60 | 5 | 23 | 3.5 | |
| | 8 0.5 | | 52 | 31.3 | 50.120 | + 1 | - 1 | -1.505 | ..... |  |  |  |
| Dec. 11* | 98 2 | 0 | 38 | 12.8 | 61.610 | + 3 | +14.731 | 154.05 | 7 | 33 | 45.8 | |
| -10 C | 98 0.5 | | 69 | 50.8 | 32.151 | 0 | + 4 | -0.191 | 71, 10.2 | | | Uncomfortable ob- serving. |
| | 7 59.5 | 0 | 48 | 34.2 | 52.588 | - 3 | - 4.341 | 45.40 | 7 | 33 | 48.5 | |
| | 7 59.5 | | 59 | 34.8 | 43.908 | + 1 | - 1 | -0.334 | ..... |  |  |  |

5 OB.

TABLE XII—Continued.

| Date. Temp. | P. | Chron. | Microm- eter. | Parallel | Obsery'd Coordi- nate. Re- fraction. | Adopted Coordi- nate. Parallax Factor. | Madi- son M. T. * Mag. | Remarks. |
|----------------|---------|--|------------------|----------|---|--|--|----------------------|
| 1900 | | ^h ^m ^s | ^r | | ^r | ^r | ^h ^m ^s | |
| Dec. 12 | 98 0 | 22 16 48.8 | [7.600] | - 1 | + 9.139 | 95.58 | 5 12 43.6 | |
| | 98 1 | 56 14.0 | [10.682] | - 3 | + 3 | +0.260 | 72, 8.5 | B. D. 46, 389. |
| -1 C | 7 59.5 | 22 23 44.2 | [9.336] | - 1 | + 8.960 | 93.70 | 5 13 19.3 | |
| | 8 0 | 50 30.2 | [8.585] | + 1 | + 3 | -1.555 | ..... |  |
| | 98 3.5 | 22 35 10.2 | 40.843 | -10 | - 7.300 | 76.35 | 5 13 19.6 | |
| | 98 3.5 | 39 4.8 | 55.422 | -10 | - 2 | +0.252 | 73, 9.8 | |
| | 7 59.5 | 22 30 28.6 | 38.661 | + 1 | + 9.486 | 99.21 | 5 13 54.7 | |
| | 8 0 | 44 56.8 | 57.633 | 0 | + 3 | -1.552 | ..... |  |
| Dec. 12* | 98 1 | 0 35 39.2 | 51.923 | - 2 | + 4.907 | 51.31 | 7 25 37.0 | |
| | 97 59.5 | 63 54.0 | 42.108 | + 1 | + 1 | -0.164 | 73, 9.8 | Good. |
| -1 C | 7 57 | 0 45 28.3 | 54.625 | - 3 | + 6.157 | 64.39 | 7 26 3.5 | |
| | 7 57 | 54 58.2 | 42.303 | - 5 | + 2 | -0.382 | ..... |  |
| Dec. 18 | 98 2 | 22 42 23.0 | -[1.383] | +11 | + 0.756 | 7.90 | 5 17 0.2 | |
| | 98 0 | 86 37.5 | + [2.884] | + 1 | 0 | +0.283 | 74, 9.2 | B. D. 43, 348. |
| +2 C | 7 58 | 22 50 0.8 | [16.566] | 0 | -17.370 | 181.66 | 5 17 36.3 | |
| | 7 58.5 | 80 11.9 | [18.172] | - 1 | - 5 | -1.405 | ..... |  |
| | 98 2 | 23 4 2.8 | 53.123 | - 2 | + 4.964 | 51.91 | 5 18 7.3 | |
| | 98 2 | 7 12.2 | 43.192 | - 1 | + 1 | +0.274 | 75, 10.5 | |
| | 7 58 | 22 58 49.5 | 50.814 | - 2 | + 2.088 | 21.84 | 5 18 28.4 | |
| | 7 58.5 | 73 7.7 | 46.633 | - 2 | + 1 | -1.400 | ..... |  |
| Dec. 18* | 98 0.5 | 1 15 18.0 | 65.868 | + 1 | +19.142 | 200.19 | 7 42 59.0 | |
| | 97 58 | 46 28.0 | 27.583 | - 3 | + 5 | -0.053 | 75, 10.5 | A single pointing. |
| +2 C | 7 59.5 | 1 29 38.6 | 53.799 | - 1 | - 5.696 | 59.56 | 7 46 13.4 | Telescope strikes |
| | 7 59.5 | 33 37.2 | 42.409 | - 2 | - 1 | -0.011 | ..... | pier. |
| | | | | | | | | A difficult observa- |
| | | | | | | | | tion. |
| Dec. 19 | 97 57 | 23 11 3.8 | 36.925 | -27 | - 9.564 | 100.03 | 5 38 29.0 | |
| | 98 2.5 | 48 53.8 | 56.052 | +27 | - 3 | +0.208 | 76, 9.3 | B. D. 43, 350. |
| +1 C | 8 0.5 | 23 25 40.5 | 15.132 | - 2 | -33.399 | 349.31 | 5 37 46.0 | A good observation. |
| | 8 0.5 | 32 50.9 | 81.926 | - 2 | - 11 | -1.220 | ..... |  |
| | 97 57 | 23 14 16.4 | -47.957 | - 2 | + 1.089 | 11.39 | 5 37 53.1 | |
| | 98 2.5 | 44 29.1 | +50.879 | + 4 | 0 | +0.209 | 77, 10.5 | |
| | 8 0.5 | 23 20 3.6 | 45.886 | 0 | - 2.952 | 30.87 | 5 37 55.8 | |
| | 8 0.5 | 38 47.4 | 51.790 | 0 | - 1 | -1.218 | ..... |  |
| Dec. 20 | 97 59.5 | 23 11 30.2 | 7.836 | + 1 | -38.608 | 403.76 | 5 35 26.8 | |
| | 98 0 | 50 13.8 | 85.054 | 0 | - 11 | +0.233 | 78, 9.8 | A good night, but |
| +1 C | 7 59.5 | 23 28 50.3 | 41.143 | + 4 | + 7.014 | 73.36 | 5 36 11.2 | comparison stars are |
| | 7 59.5 | 34 22.7 | 55.164 | + 3 | + 2 | -1.214 | ..... | too far from planet. |
| | 97 59.5 | 23 16 10.8 | 22.752 | 0 | +27.086 | 283.27 | 5 36 11.7 | |
| | 98 0 | 47 3.2 | 76.925 | 0 | + 8 | +0.228 | 79, 10.4 | |

TABLE XII—Continued.

| Date. Temp. | P. | Chron. | Microm- eter. | Parallel | Observ'd Coordi- nate. Re- fraction. | Adopted Coordi- nate. Parallax Factor. | Madi- son M. T. * Mag. | Remarks. |
|----------------|---------------------------|--|----------------------|------------------|---|--|--|---|
| 1900 | ^o ['] | ^h ^m ^s | ^r | | ^r | ["] | ^h ^m ^s | |
| Dec. 20 | 7 59.5 7 59.5 | 23 22 30.2 40 16 3 | 45.777 49.767 | - 2 - 3 | + 1.992 0 | 20.83 -1.215 | 5 35 57.9 | |
| Dec. 26 | 97 57.5 | 23 39 5.5 | 64.771 | + 5 | +16.434 + 5 | 171.90 +0.369 | 5 20 3.9 80, 11. | Clouds cut off star. Observed microm- eter coincidence 48.342. |
| - 6 C | 8 5 8 2.5 | 23 44 55.0 83 10.1 | 55.424 44.536 | +24 +15 | + 5.464 + 2 | 57 15 -1.025 | 5 44 56.9 | |
| | 97 59 97 59 | 0 2 45.6 7 50.1 | 83 985 13 235 | - 8 - 9 | -35.384 - 11 | 370.17 +0.285 | 5 46 11.9 81, 10.2 | Through thin clouds. Difficult observa- tion. |
| | 8 5 8 2.5 | 23 54 56.8 75 54 4 | 84.333 10.548 | -53 -28 | -36.933 - 12 | 386.37 -1.016 | 5 46 19.7 | |
| Dec. 28 | 97 58 97 58.5 | 23 40 40.2 88 51.0 | 76.144 25.394 | + 3 + 2 | -25.373 - 8 | 265 41 +0.351 | 5 37 48 5 82, 10 6 | A good night. |
| -10 C | 7 56 7 56 | 0 2 1.1 8 29.7 | 54.121 43 106 | +29 +27 | + 5.536 + 2 | 57.90 -1.056 | 5 38 18.2 | |
| | 97 58 97 58.5 | 23 47 16.8 84 57 8 | 76.967 15.901 | +13 + 9 | +30.544 + 9 | 319.49 +0.344 | 5 39 10.0 83, 10.8 | |
| | 7 56 7 56 | 23 54 27.2 77 21.8 | 73.165 25.724 | -32 -35 | +23.687 + 8 | 247 79 -1.049 | 5 38 57 2 | |
| Dec. 29 | 98 0 98 1 | 23 38 47.5 92 2.9 | 76.954 25.032 | + 1 + 6 | -25 958 - 8 | 271.49 +0.379 | 5 34 33.0 84, 9.6 | |
| - 3 C | 8 1 8 1 | 23 47 41.0 85 16.0 | 63.435 31.832 | - 9 - 9 | -15 810 - 5 | 165 36 -1.061 | 5 35 36.2 | |
| | 97 57 97 57 | 0 3 5 9 8 55.9 | 68.772 27.282 | +22 +17 | +20.765 + 6 | 217.18 +0.369 | 5 35 8 6 85, 10 8 | |
| | 8 1 8 1 | 23 55 22.2 77 35.4 | 75.002 25.482 | + 7 + 7 | +24.767 + 8 | 259.04 -1.064 | 5 35 36 5 | |
| Dec. 29* | 100 46 95 13 5 | 2 18 9.0 49 54.0 | [13.790] [7.678] | +1.312 -1.517 | -10.886 - 3 | 113 86 +0.227 | 8 2 45.8 84, 9.6 | Fairly good observa- tions. Micrometer is set to make large angle with the par- allel in order to test the reduction form- ula. |
| - 3 C | 10 46 5 18 | 2 29 48.7 40 0.3 | [28.275] [30.231] | -0.533 +0.479 | -29.280 - 9 | 306 24 -0.384 | 8 3 38 6 | |
| Dec. 31 | 97 59 5 98 0.5 | 23 49 9.3 103 44.9 | [14.926] [20.438] | - 4 + 9 | +17.684 + 6 | 185.01 +0.406 | 5 37 44.0 86, 9.5 | D. D. 38, 409. |
| -18 C | 8 1.5 8 1.5 | 0 12 11.6 21 25.0 | 93.396 2.307 | + 8 + 9 | -45.536 - 16 | 476.41 -1.012 | 5 38 5.2 | Stars diffuse and woolly. |
| | 97 59.5 98 0.5 | 23 56 45 5 97 51.2 | [28.030] [23.899] | + 1 - 1 | -25.964 - 8 | 271.64 +0.400 | 5 38 35.2 87, 9.5 | B. D. 38, 411. |
| | 8 1.5 8 1.5 | 0 4 46.1 30 30.4 | 76.409 62.910 | -13 -12 | + 6.737 + 2 | 70.48 -1.004 | 5 38 54.9 | |

TABLE XII.—Continued.

| Date. Temp. | P. | Chron. | Microm- eter. | Parallel | Obsv'd Coordi- nate. Re- fraction. | Adopted Coordi- nate. Parallax Factor. | Madi- son M. T. * Mag. | Remarks. |
|----------------|---------|-----------|------------------|----------|---|--|------------------------------|----------|
| | ° ' " | h m s | r | | r | " | h m s | |
| 1901 | | | | | | | | |
| Jan. 1 | 97 58 | 0 4 5.3 | 89.004 | + 7 | -38 244 | 400 05 | 5 45 3.8 | |
| | 98 0 | 51 21.8 | 12.510 | - 1 | 12 | +0.402 | 88, 9.8 | |
| -12 C | | | | | | | | |
| | 7 58 | 0 22 36.2 | 61.343 | +20 | +12.619 | 132 00 | 5 43 38.3 | |
| | 7 58 | 29 59.5 | 36.144 | +19 | 4 | -0.948 | ..... |  |
| | 97 58 | 0 9 4.6 | 69.848 | - 1 | +23 388 | 244.66 | 5 45 10.1 | |
| | 98 0 | 46 35.2 | 23.072 | 0 | 7 | +0.399 | 89, 11. | |
| | 7 58 | 0 15 26.9 | 50.849 | -12 | - 3.718 | 38.89 | 5 43 34.3 | |
| | 7 58 | 37 0.8 | 43.438 | -13 | 1 | -0.948 | ..... |  |
| Jan. 1* | 97 58 | 2 24 49.2 | 74.588 | + 1 | -24.600 | 257.33 | 7 57 51.2 | |
| | 97 59 | 56 56.5 | 25.386 | + 2 | 7 | +0.296 | 88, 9.8 | |
| -12 C | | | | | | | | |
| | 7 55.5 | 2 37 41.8 | 50.237 | + 4 | - 2.321 | 24 28 | 7 58 34.7 | |
| | 7 55.5 | 45 31.1 | 45.588 | + 3 | 1 | +0.327 | ..... |  |
| Jan. 2 | 98 3 | 0 5 45.0 | 29.883 | 0 | +21.082 | 220.56 | 5 44 59.9 | |
| | 98 2 | 57 23.5 | 72.047 | + 1 | 7 | +0.422 | 90, 10. | |
| -17 C | | | | | | | | |
| | 7 58.5 | 0 20 59.2 | 47.974 | - 7 | - 1.471 | 15 38 | 5 46 55.9 | |
| | 7 58.5 | 46 1.8 | 50.901 | - 8 | 0 | -0.903 | ..... |  |
| | 98 3 | 0 11 56.9 | 26.754 | +12 | -19 476 | 203.75 | 5 46 17.7 | |
| | 98 2 | 53 47.5 | 65.728 | + 9 | 6 | +0.416 | 91, 11. | |
| | 7 58.5 | 0 28 31.9 | 35.680 | + 8 | -13.170 | 137.78 | 5 46 49.4 | |
| | 7 58.5 | 38 16.1 | 62.036 | + 7 | 4 | -0.905 | ..... |  |
| Jan. 3 | 98 0.5 | 2 43 54.6 | 64.459 | -26 | +17.674 | 184.86 | 8 8 41.9 | |
| | 97 54.5 | 75 17.4 | 29.092 | + 7 | 5 | +0.358 | 92, 10.5 | |
| -5 C | | | | | | | | |
| | 7 59.5 | 2 53 33.5 | [19.206] | +17 | +18.601 | 194.56 | 8 7 48.5 | |
| | 7 59.5 | 63 51.2 | [17.961] | +18 | 6 | +0.513 | ..... |  |
| Jan. 8 | 97 59.5 | 0 49 5.0 | 32.245 | - 3 | -14.869 | 155.52 | 5 51 17.6 | |
| | 98 2 | 73 53.3 | 62.004 | +24 | 4 | +0.508 | 93, B. D. 34, 442. | |
| -7 C | | | | | | | | |
| | 8 0 5 | 0 58 1.5 | 12.864 | - 3 | -36.017 | 376.73 | 5 51 52.0 | |
| | 8 0.5 | 66 5.9 | 84.892 | - 3 | 11 | -0.714 | ..... |  |
| | 98 2 | 1 20 44.8 | 61.355 | -10 | -11.702 | 122.40 | 6 22 40.1 | |
| | 96 23.5 | 45 9.0 | 37.626 | +336 | 4 | +0.479 | 94, 9.5 | |
| | 7 58.5 | 1 25 53.4 | 62.514 | + 4 | +13.702 | 143.28 | 6 19 51.3 | |
| | 7 58.5 | 34 21.9 | 35.117 | + 4 | 4 | -0.557 | ..... |  |
| Jan. 12 | 97 55 | 1 7 3.1 | 57.405 | + 6 | +12.000 | 125.52 | 6 10 9.9 | |
| | 98 7.5 | 65 17.0 | 33.404 | - 8 | 4 | +0.573 | 95, 10.5 | |
| -7 C | | | | | | | | |
| | 8 4 | 1 24 30.0 | 53.085 | +11 | + 4.252 | 44.48 | 6 2 8.4 | |
| | 8 4 | 31 44.5 | 44.609 | +17 | 1 | -0.646 | ..... |  |
| | 97 55 | 1 11 40.6 | 71.207 | -10 | +25.343 | 265.09 | 6 10 12.8 | |
| | 98 7.5 | 60 45.2 | 20.542 | +31 | 8 | +0.570 | 96, 11. | |

TABLE XII—Continued.

| Date. Temp. | P. | Chron. | Microm- eter. | Parallel | Observ'd Coordi- nate. Re- fraction. | Adopted Coordi- nate. Parallax Factor. | Madi- son M. T. * Mag. | Remarks. |
|----------------|---------|--------------|------------------|----------|---|--|------------------------------|---|
| 1901 | | <i>h m s</i> | <i>r</i> | | <i>r</i> | <i>s</i> | <i>h m s</i> | |
| Jan. 12 | 8 4 | 1 18 20.0 | 56.831 | +29 | -10.592 | 110 79 | 6 6 40.5 | |
| | 8 4 | 46 59.9 | 35.584 | +33 | - 3 | - 0.602 | ..... |  |
| Jan. 14 | 97 58 | 1 5 45.0 | -45.844 | -17 | + 0.137 | 1.43 | 5 58 3.6 | |
| | 98 2 | 58 2.2 | +45.579 | +26 | 0 | + 0.627 | 97, 10.5 | |
| +2 C | 7 54 | 1 13 49.7 | 14 849 | + 3 | -36.214 | 378.72 | 5 57 29.7 | |
| | 7 54 | 48 49.6 | 87.278 | - 3 | - 10 | - 0.671 | ..... |  |
| | 97 58.5 | 1 28 25.0 | 32.661 | + 4 | +15.964 | 166 95 | 5 57 22.7 | |
| | 97 58 5 | 34 0.3 | 64.582 | + 4 | + 5 | + 0.622 | 98, 11.5 | |
| | 7 54 | 1 21 48.8 | 35.718 | -25 | +11.122 | 116.28 | 5 57 28.7 | |
| | 7 54 | 40 48.4 | 58.014 | -28 | + 3 | - 0.672 | ..... |  |
| Jan. 16 | 98 0.5 | 1 32 42.8 | -47.044 | - 2 | + 0.016 | 0.17 | 6 4 10.2 | Very faint and diffi- cult. Through thin clouds. |
| | 97 58 | 59 2.4 | +47.011 | + 2 | 0 | + 0.650 | 99, 12. | |
| -7 C | 8 0 | 1 41 24.7 | 42.289 | 0 | + 5.419 | 56.68 | 6 3 53.9 | |
| | 8 0 | 49 47.9 | 53.127 | 0 | + 2 | -0.596 | ..... |  |
| Jan. 17 | 98 2.5 | 1 34 6.8 | 88.861 | +15 | -38.342 | 401.10 | 6 9 59.4 | |
| | 98 3 | 77 10.3 | 12.137 | +24 | - 12 | +0.662 | 100, 10.8 | |
| -14 C | 7 59 | 1 47 5.5 | 70.062 | + 9 | -22.893 | 239.50 | 6 8 53.2 | |
| | 7 59 | 61 58.9 | 24.258 | + 9 | - 7 | -0.540 | ..... |  |
| Jan. 18 | 98 1 | 1 33 11.0 | 77.982 | + 5 | +31.240 | 326.77 | 5 59 38.5 | B. D. 30, 477. Through clouds. Very bad seeing. |
| | 98 6 | 65 12.6 | 15.539 | +33 | + 10 | +0.694 | 101, 7.0 | |
| -9 C | 8 1 | 1 45 17.2 | 63.261 | +11 | -15.076 | 157.71 | 5 56 40.8 | |
| | 8 1 | 47 10.1 | 33.087 | +11 | - 5 | -0.647 | ..... |  |
| Jan. 19 | 97 59 | 1 40 4.8 | 59.333 | - 4 | +13.080 | 136.82 | 6 7 57.0 | |
| | 98 1 | 82 49.8 | 33.160 | - 8 | + 4 | +0.706 | 102, 9.5 | |
| -7 C | 7 59 | 1 58 23.6 | 27.934 | - 3 | -20.470 | 214.11 | 6 5 24.7 | |
| | 7 59 | 59 25.6 | 68.867 | - 4 | - 6 | - 0.558 | ..... |  |
| | 97 59 | 1 43 1.6 | 82.724 | - 2 | -32.514 | 340.09 | 6 7 27.9 | B. D. 29, 517. |
| | 98 1 | 78 54.9 | 17.696 | + 3 | - 10 | + 0.706 | 103, 8.0 | |
| | 7 59 | 1 49 14.2 | 58.393 | + 8 | -11.949 | 124.98 | 6 7 8.4 | |
| | 7 59 | 72 3.1 | 34.479 | + 8 | - 3 | - 0.541 | ..... |  |
| Jan. 21 | 98 1.5 | 1 33 25.4 | 14.193 | +12 | -32.488 | 339.81 | 5 48 50.9 | |
| | 97 58.5 | 66 54.8 | 79.169 | -11 | - 11 | + 0.764 | 104, .. | B. D. 29, 531. |
| -3 C | 7 59.5 | 1 45 33.1 | 21.864 | + 2 | -27.494 | 287.56 | 5 50 15.8 | A pretty good night. |
| | 7 59.5 | 57 37.2 | 76.856 | + 2 | - 8 | - 0.686 | ..... |  |
| Jan. 23 | 97 57.5 | 2 3 12.8 | 82.088 | 0 | +35.570 | 372.01 | 6 11 59.0 | Comparison star al- most invisible through dew formed on objective. Planet appears 11 m. Poor observation. |
| | 98 2.5 | 39 12.8 | 10.950 | + 2 | + 11 | + 0.770 | 105, 11.5 | |
| 0 C | | 2 13 47.5 | 5° 58.1' | 0 | - 2.290 | 23.95 | 6 10 48.0 | |
| | 7 59.5 | 26 15.6 | [3.340] | - 3 | - 1 | - 0.481 | | |

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PUBLICATIONS

OF THE

WASHBURN OBSERVATORY

OF THE

UNIVERSITY OF WISCONSIN.

VOL. X. PART 3.

Observations of Double Stars.

1897—1906.

BY GEORGE C. COMSTOCK,
DIRECTOR.

MADISON, WIS.:
DEMOCRAT PRINTING COMPANY, STATE PRINTER.
1906.

The Washburn Observatory.

FOUNDED BY

Cadwallader C. Washburn.

Born 1818; Died 1882.

INTRODUCTION.

THE observations of double stars contained in the following pages are in continuation of the series published in Part 1 of the present volume. They have been made by the same observer, with the same instrument and under similar conditions, save as set forth below, and are supposed to constitute with those first published a homogeneous series. Referring to pp. 25-49, Vol. VI, Part 2, and pp. 2-6, Vol. X, Part 1, Publications of the Washburn Observatory, for a more detailed account of the instrument and methods of observing employed, there may be here noted the following circumstances having special reference to the present series of observations.

The position of the polar axis has continued substantially unchanged during the entire period covered by the present series of observations, as is shown by the following determinations of ξ and η , the spherical coordinates of the instrumental pole referred to the true pole of the heavens. A positive value of ξ denotes that the axis points too high, a positive value of η that it points too far west.

| OBSERVED. | ξ | η | i |
|---------------|-------|--------|------|
| 1896 Aug. 24 | -1.1 | -1.5 | -1.9 |
| 1897 June 7 | -0.3 | -1.8 | -0.0 |
| 1901 April 26 | -1.2 | -1.0 | -0.6 |
| 1906 July 7 | -0.4 | -1.2 | -1.2 |

The quantity i represents the amount by which the angle between the polar and declination axes differs from 90° . No account has been taken of the above instrumental errors or of the effect of refraction.

In the early summer of 1901 the star images were found to show, under favorable circumstances, traces of a tail in position angle 220° . On June 12 the objective was adjusted, "squared on," and the images have since that date been irreproachable.

In March, 1899, the old driving clock, with Bond spring governor, which had never worked well and which had deteriorated through age, was replaced by a new clock with double conical pendulum, designed and constructed by Edmund Kandler of Chicago. While this clock possesses many imperfections it is a great improvement upon the original apparatus and a decided advantage to the observations.

In January, 1902, an electric motor was installed for turning the dome and handling the shutter, thus relieving the observer from a serious burden of physical labor hitherto performed by hand, to the prejudice of his personal equation.

An additional ocular, constructed for the Eros observations of 1900-'01, has been available for subsequent work and has proved very useful in the measurement of

wide pairs. It is represented by the symbol X in the following complete exhibit of all oculars employed in this series.

| Ocular. | Field. | Power. | Design. |
|---------|--------|--------|------------|
| III | 5.6 | 439 | Ramsden. |
| IV | 3.6 | 792 | " |
| V | 7.7 | 325 | Steinheil. |
| VI | 5.1 | 537 | " |
| VII | 3.4 | 716 | " |
| VIII | 2.9 | 850 | " |
| X | 10.8 | 288 | Ramsden, |

As a part of the Eros campaign, executed in 1900, 1901, the micrometer screw was reinvestigated (See Vol. X, Part 2) and the resulting value of a revolution of the screw, $10''.455$, has been employed in the reduction of the observations here published. The disparity between this value and that hitherto employed, $10''.446$, is of little consequence in view of the uniformly small distances with which we are here concerned. Within the range of distance covered by these observations the periodic and progressive errors of the screw are insensible and have been neglected.

In all observations subsequent to January 1, 1901, the parallel has been determined by the method of transits over inclined threads, set forth at pp. 5-7, of Vol. X, Part 2, of these Publications. This method is not only more convenient than that hitherto employed, of finding by trial a position of the micrometer in which the diurnal motion of an equatorial star should be sensibly parallel to the threads, but it is considerably more accurate and may be applied with equal facility in any part of the sky.

While the several ameliorations above set forth tend toward increased precision in the individual observations the resulting improvement is quantitatively small, the beneficial effects being perhaps offset by diminishing acuteness of vision on the part of the observer. From a discussion of the residuals furnished by those stars whose distances are included between the limits $4''.5$ and $6''.0$ and which were observed on three or more nights in any year subsequent to 1900, I find for the probable error of a position angle observed on a single night, the value $r = \pm 0''.68$. From corresponding data for the same stars observed prior to 1900 I find $r = \pm 0''.70$. The precision of the earlier and later observations, in so far as it can be shown by residuals, is therefore the same.

The adopted form of publication is similar to that of the earlier series but differs from it in respect of the adopted mean distances between the components of very close pairs. In taking the annual means of these distances I have included in the mean the estimated values, marked *est*, without applying to these the small systematic corrections hitherto employed and shown at p. 5, Part 1, of this volume.

The coordinates of the stars are referred to the equinox of 1900.

OBSERVATIONS OF DOUBLE STARS.

7

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece. | Remarks. |
|-------|----------|----------|----------|-----------|----------|
| | <i>h</i> | <i>o</i> | <i>'</i> | | |

Σ 3062

R. A., 0h 1m.0

Dec., +57° 53'

| | | | | | |
|----------|------|--------|------|--------|-------|
| 1896.947 | 3.4 | 334.6 | 1.52 | III | Good. |
| 1897.728 | 21.4 | 336.7 | 1.56 | IV | |
| 1901.833 | 22.8 | 346.0 | 1.43 | III | |
| .871 | 22.9 | 342.8 | 1.69 | VII | |
| 1906.174 | 6.0 | 348.2 | 1.14 | VI | Good. |
| 1897.338 | 2 n | 335.65 | 1.54 | Means. | |
| 1901.852 | 2 n | 344.40 | 1.56 | | |
| 1906.174 | 1 n | 348.20 | 1.14 | | |

Σ 2

R. A., 0h 3m.8

Dec., +79° 10'

| | | | | | |
|----------|------|--------|------------------|----|------------------------|
| 1897.722 | 19.8 | 151.1 | 0.35 <i>est.</i> | IV | Notched. |
| .728 | 21.7 | 335.2 | 0.35 <i>est.</i> | IV | Blurred and difficult. |
| 1897.725 | 2 n | 153.15 | 0.35 | | |

OΣ 4

R. A., 0h 11m.5

Dec., +35° 56'

| | | | | | |
|----------|-----|--|--|--|---------|
| 1902.042 | 4.2 | | | | Cannot. |
|----------|-----|--|--|--|---------|

Σ 19

R. A., 0h 11m.5

Dec., +36° 4'

| | | | | | |
|----------|------|--------|------|----|--|
| 1902.037 | 2.6 | 134.6 | 2.36 | V | |
| .042 | 4.2 | 135.4 | 2.19 | VI | |
| 1904.825 | 23.3 | 133.2 | 2.11 | V | |
| 1902.040 | 2 n | 135.00 | 2.28 | | |
| 1904.825 | 1 n | 133.20 | 2.11 | | |

OBSERVATIONS OF DOUBLE STARS.

| Date. | Sid. T. | p | s | Eyepiece. | Remarks. |
|-------|---------|-----|-----|-----------|----------|
| | h | o | . | | |

 Σ 60, η CASSIOPEIAE

R. A., 0h 43m.0

Dec., +57° 17'

| | | | | | |
|----------|------|--------|------|-----|-------------------------------|
| 1901.833 | 23.1 | 223.9 | 5.32 | III | Blurred. Good. Blurred. |
| .836 | 22.1 | 224.3 | 5.23 | III | |
| .852 | 23.2 | 223.9 | 5.23 | III | |
| .855 | 22.8 | 223.7 | 5.33 | VII | |
| 1904.825 | 23.0 | 231.7 | 5.34 | V | |
| .883 | 23.4 | 232.6 | 5.55 | III | |
| .904 | 23.8 | 229.6 | 5.59 | V | |
| 1906.174 | 6.2 | 233.2 | 6.30 | VI | |
| .226 | 7.4 | 231.9 | 6.05 | X | |
| .649 | 18.8 | 228.4 | 4.65 | VII | |
| 1901.844 | 4 n | 223.95 | 5.28 | | |
| 1904.871 | 3 n | 231.30 | 5.49 | | |
| 1906.350 | 3 n | 231.17 | 5.67 | | |

 Σ 73, 36 ANDROMEDAE

R. A., 0h 49m.6

Dec., +23° 5'

| | | | | | |
|----------|------|------|------|-----|--|
| 1896.818 | 0.5 | 15.2 | 1.16 | IV | |
| .947 | 1.3 | 15.2 | 1.34 | IV | |
| 1897.835 | 23.7 | 15.8 | 1.10 | IV | |
| 1901.868 | 23.2 | 19.9 | 1.02 | VII | |
| .871 | 23.8 | 18.8 | 1.07 | VII | |
| .885 | 1.9 | 21.8 | 1.26 | VII | |
| 1904.825 | 23.5 | 23.6 | 1.08 | VI | |
| .883 | 23.9 | 21.5 | 0.89 | VII | |
| .904 | 23.5 | 24.7 | 0.95 | VII | |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece. | Remarks. |
|-------|----------|----------|----------|-----------|----------|
| | <i>h</i> | <i>o</i> | <i>s</i> | | |

36 ANDROMEDAE—Continued.

| | | | | | |
|----------|------------|-------|------|--------|--|
| 1896.882 | 2 <i>n</i> | 15.20 | 1.25 | Means. | |
| 1897.835 | 1 <i>n</i> | 15.80 | 1.10 | | |
| 1901.875 | 3 <i>n</i> | 20.17 | 1.12 | | |
| 1904.871 | 3 <i>n</i> | 23.27 | 0.97 | | |

O Σ 20, 66 PISCUMR. A., 0^h 49^m.2

Dec., +18° 39'

| | | | | | |
|----------|------|-------|------------------|-----|-------------------|
| 1896.818 | 0.6 | 335.3 | 0.35 <i>est.</i> | IV | Not separated. |
| 1897.835 | 0.0 | 328.2 | 0.35 <i>est.</i> | IV | Notched. |
| 1901.880 | 23.4 | 328.3 | 0.49 | VII | Not separated. |
| .885 | 2.1 | 320.0 | 0.52 | VII | Blurred. |
| 1902.037 | 2.9 | 319.2 | 0.52 | VII | Hardly separated. |

O Σ 515, ϕ ANDROMEDAER. A., 1^h 3^m.7

Dec., +46° 43'

| | | | | | |
|----------|-----|-------|------------------|------|------------|
| 1903.182 | 6.4 | 243.2 | 0.25 <i>est.</i> | VIII | Elongated. |
|----------|-----|-------|------------------|------|------------|

 Σ 186R. A., 1^h 50^m.7

Dec., +1° 21'

| | | | | | |
|----------|-----|------|------|-----|------------|
| 1901.885 | 2.2 | 25.6 | 0.54 | VII | Blurred. |
| .975 | 1.3 | 19.6 | 0.55 | VII | Blurred. |
| 1902.037 | 3.2 | 25.9 | 0.57 | VII | Separated. |

2 OBS.

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece. | Remarks. |
|-------|----------|----------|----------|------------|----------|
| | <i>h</i> | <i>o</i> | <i>'</i> | | |

Σ 186—Continued.

| | | | | | |
|----------|------------|--------|------|--------|-----------|
| 1904.825 | 23.7 | 212.5 | 0.52 | VII | Poor obs. |
| .883 | 23.7 | 210.0 | 0.58 | VII | |
| .904 | 0.1 | 208.8 | 0.58 | VII | |
| 1901.906 | 3 <i>n</i> | 23.70 | 0.55 | Means. | |
| 1904.871 | 3 <i>n</i> | 210.43 | 0.56 | | |

β 513, 48 CASSIOPEIAE

R. A., 1h 53m.7

Dec., +70° 25'

| | | | | | |
|----------|-----|--|--|--|-----------------------|
| 1903.152 | 7.8 | | | | No companion visible. |
| .182 | 6.5 | | | | Round. |

OS 38, γ ANDROMEDAE, B C

R. A., 1h 57m.8

Dec., +41° 51'

| | | | | | |
|----------|-----|-------|------------------|------|-------------------------|
| 1896.818 | 0.2 | 119.8 | 0.25 <i>est.</i> | IV | Cuneiform. |
| 1897.835 | 0.1 | 122.8 | 0.25 <i>est.</i> | IV | Elongated. Difficult. |
| 1902.106 | 4.8 | 104.0 | 0.40 <i>est.</i> | VII | Blurred. Not separated. |
| .110 | 5.4 | 115.5 | 0.54 | VIII | Distance is too great. |
| .132 | 5.5 | 108.3 | 0.35 <i>est.</i> | VII | Separated by glimpses. |
| 1903.182 | 6.7 | 110.1 | 0.40 | VIII | Blurred. |
| 1904.825 | 0.1 | 112.5 | 0.49 | VII | |
| .841 | 0.7 | 107.5 | 0.51 | VIII | |
| 1906.174 | 6.4 | 99.0 | 0.44 | VII | By glimpses. |
| .226 | 7.6 | 88.8 | 0.3 <i>est.</i> | VII | Not separated. |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece. | Remarks. |
|-------|----------|----------|----------|-----------|----------|
| | <i>h</i> | <i>o</i> | <i>s</i> | | |

 γ ANDROMEDAE—Continued.

| | | | | | |
|----------|------------|--------|------|--------|--|
| 1896.818 | 1 <i>n</i> | 119.80 | 0.25 | Means. | |
| 1897.835 | 1 <i>n</i> | 122.80 | 0.25 | | |
| 1902.116 | 3 <i>n</i> | 109.27 | 0.43 | | |
| 1903.182 | 1 <i>n</i> | 110.10 | 0.40 | | |
| 1904.833 | 2 <i>n</i> | 110.00 | 0.50 | | |
| 1906.200 | 2 <i>n</i> | 93.90 | 0.37 | | |

 Σ 228

R. A., 2h 7m.7

Dec., +47° 1'

| | | | | | |
|----------|------------|-------|-----------------|--------|----------|
| 1902.105 | 4.8 | 86.7 | 0.58 | VII | |
| .110 | 5.2 | 87.5 | 0.62 | VII | |
| .116 | 5.1 | 87.6 | 0.49 | VIII | |
| 1904.825 | 0.3 | 94.6 | 0.49 | VII | |
| .841 | 0.9 | 88.7 | 0.54 | VIII | Blurred. |
| 1906.174 | 6.6 | 90.6 | 0.60 | VII | |
| .226 | 7.7 | 88.1 | 0.5 <i>est.</i> | VII | |
| 1902.110 | 3 <i>n</i> | 87.27 | 0.56 | Means. | |
| 1904.833 | 2 <i>n</i> | 91.65 | 0.52 | | |
| 1906.200 | 2 <i>n</i> | 89.35 | 0.55 | | |

20 PERSEI, B C.

R. A., 2h 47m.2

Dec., +37° 55'

| | | | | | |
|----------|-----|--|--|------|---------|
| 1903.168 | 7.2 | | | VIII | Cannot. |
| .182 | 6.8 | | | VIII | Cannot. |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece. | Remarks. |
|-------|---------|----------|----------|------------|----------|
| | h | o | ' | | |

Σ 333, ε ARIETIS

R. A., 2h 53m.5

Dec., +20° 56'

| | | | | | |
|----------|------------|--------|------|--------|--------------------------------|
| 1896.947 | 1.7 | 199.2 | 1.40 | IV | Very blurred. Very blurred. |
| 1901.868 | 23.4 | 200.5 | 1.40 | VII | |
| .871 | 0.1 | 201.3 | 1.30 | VII | |
| .885 | 2.4 | 200.1 | 1.31 | VII | |
| 1902.132 | 5.1 | 203.7 | 1.30 | VII | |
| 1904.904 | 0.6 | 199.7 | 1.30 | VII | |
| .915 | 23.8 | 198.9 | 0.94 | VII | |
| 1896.947 | 1 <i>n</i> | 199.20 | 1.40 | Means. | |
| 1901.875 | 3 <i>n</i> | 200.63 | 1.34 | | |
| 1902.132 | 1 <i>n</i> | 203.70 | 1.30 | | |
| 1904.910 | 2 <i>n</i> | 199.30 | 1.12 | | |

OΣ 53

R. A., 3h 11m.3

Dec., +38° 16'

| | | | | | |
|----------|------------|--------|-------|--------|--|
| 1896.947 | 1.9 | 243.9 | 0.50 | IV | Difficult. Very blurred. Blurred. Not separated. Separated. |
| 1898.241 | 8.1 | 238.8 | 0.57 | IV | |
| 1901.833 | 23.3 | 237.2 | 0.56 | VII | |
| .868 | 23.7 | 234.0 | 0.60 | VII | |
| 1902.105 | 5.2 | 232.2 | 0.4 ± | VII | |
| 1904.825 | 0.4 | 234.9 | 0.41 | VII | |
| 1906.174 | 6.8 | 231.9 | 0.26 | VII | |
| 1897.594 | 2 <i>n</i> | 241.35 | 0.54 | Means. | |
| 1901.935 | 3 <i>n</i> | 234.47 | 0.52 | | |
| 1905.500 | 2 <i>n</i> | 233.40 | 0.34 | | |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece. | Remarks. |
|-------|---------|----------|----------|------------|----------|
| | h | o | ' | | |

Σ 412, 7 TAURI, A B.

R. A., 3h 28m.5

Dec., +24° 8'

| | | | | | |
|----------|------------|------------------|------------------|--------|-------------------------|
| 1901.975 | 1.7 | 180. <i>est.</i> | 0.25 <i>est.</i> | VII | Doubtful. |
| 1902.132 | .... | 359.3 | 0.20 <i>est.</i> | VII | Very slight elongation. |
| 1903.152 | 7.5 | Suspect | elongation | in 0°. | |
| .168 | 7.1 | 203.9 | 0.25 <i>est.</i> | VIII | Doubtful elongation. |
| .182 | 6.3 | 2.5 | 0.20 <i>est.</i> | VIII | Doubtful elongation. |
| 1902.054 | 2 <i>n</i> | 179.65 | 0.22 | Means. | |
| 1903.175 | 2 <i>n</i> | 193.20 | 0.22 | | |

Σ 412, 7 TAURI, A C.

R. A., 3h 28m.5

Dec., +24° 8'

| | | | | | |
|----------|-----|------|-------|----|--|
| 1901.975 | 1.7 | 58.9 | 22.02 | VI | |
|----------|-----|------|-------|----|--|

OΣ 65

R. A., 3h 44m.3

Dec., +25° 17'

| | | | | | |
|----------|------------|--------|------|--------|---------------|
| 1901.885 | 2.6 | 202.9 | 0.64 | VII | |
| .943 | 0.9 | 197.8 | 0.52 | VII | Very blurred. |
| .975 | 2.0 | 202.2 | 0.62 | VII | Blurred. |
| 1906.174 | 6.9 | 204.8 | 0.80 | VII | |
| 1901.934 | 3 <i>n</i> | 200.97 | 0.59 | Means. | |
| 1906.174 | 1 <i>n</i> | 204.80 | 0.80 | | |

OBSERVATIONS OF DOUBLE STARS.

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece. | Remarks. |
|-------|---------|----------|----------|-----------|----------|
| | h | o | ' | | |

W. O. 66. LI. 7187

R. A., 3h 47m.8

Dec., -8° 47'

| | | | | | |
|----------|-----|-------|------|-------|---|
| 1901.880 | 1.4 | 23.7 | 1.78 | X | Very faint and difficult. |
| 1902.037 | 3.7 | 33.0 | 2.32 | X | Very faint and difficult. |
| .042 | 4.5 | 33.1 | 2.19 | X | Pretty good. |
| 1901.986 | 3 n | 29.87 | 2.10 | Mean. | No motion in thirteen years, but the proper motion of the star indicates a physical connection. |

O Σ 77

R. A., 4h 9m.6

Dec., +31° 27'

| | | | | | |
|----------|-----|--------|------------------|-------|-----------------------|
| 1903.152 | 7.6 | 190.3 | 0.25 <i>est.</i> | VIII | Elongated. |
| .168 | 6.9 | 194.9 | 0.20 <i>est.</i> | VIII | Elongated. Difficult. |
| .182 | 6.9 | 9.0 | 0.25 <i>est.</i> | VIII | Elongated. Difficult. |
| 1903.167 | 3 n | 191.40 | 0.23 | Mean. | |

 Σ 518, 40 ERIDANI, B C.

R. A., 4h 10m.8

Dec., -7° 47'

| | | | | | |
|----------|-----|-------|------|--------|------------|
| 1896.947 | 2.7 | 79.5 | .... | III | Difficult. |
| 1901.880 | 1.7 | 64.0 | 2.41 | X | Difficult. |
| 1902.037 | 4.0 | 62.6 | 2.17 | X | |
| .042 | 4.7 | 61.3 | 2.22 | X | Good. |
| .047 | 4.3 | 59.7 | 2.19 | X | Difficult. |
| 1903.182 | 6.1 | 55.9 | 1.97 | V | Good. |
| 1896.947 | 1 n | 79.50 | .... | Means. | |
| 1902.001 | 4 n | 61.90 | 2.25 | | |
| 1903.182 | 1 n | 55.90 | 1.97 | | |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece. | Remarks. |
|-------|---------|----------|----------|-----------|----------|
| | h | ° | ' | | |

O Σ 79, 55 TAURIR. A., 4^h 14^m.2

Dec., +16° 17'

| | | | | | |
|----------|-----|--------|------------------|--------|--------------------|
| 1902.042 | 5.2 | 262.8 | 0.20 <i>est.</i> | VII | Wedge (?). |
| .110 | 5.8 | 260.8 | 0.20 <i>est.</i> | VIII | Slight elongation. |
| 1903.146 | 7.9 | 261.7 | 0.30 <i>est.</i> | VII | Elongated. |
| .168 | 6.6 | 262.0 | 0.28 | VIII | Wedge. |
| .182 | 7.1 | 260.6 | 0.30 <i>est.</i> | VIII | Wedge. |
| 1902.076 | 2 n | 261.80 | 0.20 | Means. | |
| 1903.165 | 3 n | 261.43 | 0.29 | | |

O Σ 82R. A., 4^h 17^m.1

Dec., +14° 49'

| | | | | | |
|----------|-----|--------|------|--------|------------------------|
| 1896.947 | 2.3 | 137.1 | 0.55 | IV | |
| 1901.975 | 2.2 | 120.4 | 0.62 | VII | Thro' clouds. Blurred. |
| 1902.042 | 5.4 | 118.9 | 0.60 | VII | |
| .058 | 3.0 | 118.2 | 0.60 | VII | Blurred. |
| 1896.947 | 1 n | 137.10 | 0.55 | Means. | |
| 1902.008 | 3 n | 119.17 | 0.61 | | |

 β 883R. A., 4^h 45^m.6

Dec., +10° 54'

| | | | | | |
|----------|-----|---------|------------------|-------|------------|
| 1902.110 | 6.0 | Suspect | elongation in | 250°. | |
| 1903.146 | 8.1 | 267.1 | 0.20 <i>est.</i> | VII | Elongated. |
| .149 | 7.2 | 268.3 | 0.25 <i>est.</i> | VIII | Elongated. |
| .168 | 6.4 | 262.5 | 0.25 <i>est.</i> | VIII | Wedge. |
| 1903.154 | 3 n | 265.97 | 0.23 | Mean. | |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece. | Remarks. |
|-------|---------|----------|----------|-----------|----------|
| | h | o | . | | |

 β 552. ORIONIS, 11

R. A., 4h 46m.2

Dec., +13° 29'

| | | | | | |
|----------|------------|--------|-----------------|--------|--------------------------|
| 1902.141 | 6.1 | 211.4 | 0.4 <i>est.</i> | VIII | Separated by glimpses. |
| 1903.146 | 8.2 | ..... | .... | VIII | Cannot. |
| .149 | 7.4 | 225.7 | 0.45 | VIII | |
| .168 | 6.3 | 222.9 | 0.38 | VIII | Difficult but separated. |
| .182 | 7.2 | 220.4 | 0.42 | VIII | |
| 1902.141 | 1 <i>n</i> | 211.40 | 0.40 | Means. | |
| 1903.166 | 3 <i>n</i> | 223.00 | 0.42 | | |

 α 89

R. A., 4h 52m.1

Dec., +73° 55'

| | | | | | |
|----------|-----|-------|-------|------|---------|
| 1903.146 | 8.3 | ..... | ..... | VIII | Single. |
| .168 | 6.8 | ..... | ..... | VIII | Cannot. |

 α 92

R. A., 4h 53m.4

Dec., +39° 15'

| | | | | | |
|----------|------------|--------|------|-------|---------------|
| 1901.975 | 3.9 | 253.0 | 3.13 | III | Good. |
| 1902.196 | 7.0 | 252.1 | 2.79 | VI | Very blurred. |
| 1902.086 | 2 <i>n</i> | 252.55 | 2.96 | Mean. | |

 α 98, 14 ORIONIS

R. A., 5h 2m.4

Dec., +8° 22'

| | | | | | |
|----------|-----|-------|------|-----|---------------|
| 1898.225 | 7.5 | 178.3 | 0.97 | IV | |
| 1902.037 | 4.4 | 170.3 | 0.73 | VI | |
| .064 | 3.9 | 169.9 | 0.80 | VII | Blurred. |
| .116 | 5.3 | 171.0 | 0.79 | III | Very blurred. |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece. | Remarks. |
|-------|----------|----------|----------|-----------|----------|
| | <i>h</i> | <i>o</i> | <i>r</i> | | |

OΞ 98, 14 ORIONIS—Continued.

| | | | | | |
|----------|------------|--------|------|--------|--|
| 1906.174 | 7.2 | 162.7 | 1.12 | VI | |
| .226 | 7.9 | 164.1 | 0.93 | VI | |
| .289 | 8.9 | 166.0 | 1.10 | VI | |
| 1898.225 | 1 <i>n</i> | 178.30 | 0.97 | Means. | |
| 1902.072 | 3 <i>n</i> | 170.40 | 0.77 | | |
| 1906.230 | 3 <i>n</i> | 164.27 | 1.05 | | |

OΞ 517

R. A., 5h 8m.3

Dec., +1° 51'

| | | | | | |
|----------|------------|--------|------------------|-------|------------|
| 1903.149 | 7.5 | 287.7 | 0.27 | VIII | Elongated. |
| .152 | 8.0 | ..... | .... | .... | Cannot. |
| .168 | 6.1 | 318.0 | 0.30 <i>est.</i> | VIII | Elongated. |
| 1903.159 | 2 <i>n</i> | 302.85 | 0.28 | Mean. | |

Ξ 749

R. A., 5h 30m.9

Dec., +26° 52'

| | | | | | |
|----------|-----|-------|------|-----|--|
| 1901.975 | 3.2 | 168.2 | 0.92 | VII | |
|----------|-----|-------|------|-----|--|

OΞ 149

R. A., 6h 30m.2

Dec., +27° 22'

| | | | | | |
|----------|------|-------|------|------|----------------------------|
| 1897.288 | 9.3 | 281.5 | 0.68 | IV | Blurred and difficult. |
| .296 | 10.1 | 282.0 | 0.68 | IV | Difficult. |
| 1898.249 | 8.9 | 280.6 | 0.58 | IV | Blurred and difficult. |
| .263 | 9.0 | 280.2 | 0.56 | IV | Blurred. |
| 1899.252 | 8.4 | .... | .... | .... | Suspect elongation in 260° |
| .255 | 8.7 | 273.7 | 0.55 | VIII | Blurred and difficult. |
| .266 | 8.9 | 279.3 | 0.67 | VII | |

3 OBS.

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece. | Remarks. |
|-------|---------|----------|----------|------------|----------|
| | h | o | ' | | |

O Σ 149—Continued.

| | | | | | |
|----------|-----|--------|------|--------|------------------------|
| 1901.266 | 9.4 | 273.8 | 0.63 | VII | Blurred and difficult. |
| .315 | 9.8 | 272.0 | 0.73 | VII | |
| .976 | 3.4 | 276.4 | 0.72 | VII | Very blurred. |
| 1902.064 | 4.2 | 276.1 | 0.77 | VII | Very blurred. |
| .171 | 8.1 | 274.0 | 0.66 | VIII | |
| 1906.174 | 7.5 | 272.7 | 0.70 | VI | |
| .289 | 9.1 | 264.8 | 0.93 | VII | |
| 1897.292 | 2 n | 281.75 | 0.68 | Means. | |
| 1898.256 | 2 n | 280.40 | 0.57 | | |
| 1899.260 | 2 n | 276.50 | 0.61 | | |
| 1901.290 | 2 n | 272.90 | 0.68 | | |
| 1902.070 | 3 n | 275.50 | 0.72 | | |
| 1906.232 | 2 n | 268.75 | 0.82 | | |

SIRIUS

R. A., 6h 40m.7

Dec., -16° 35'

| | | | | | |
|----------|-----|------|------|------|---------------------------|
| 1903.149 | 7.7 | .... | .... | VIII | Cannot see <i>comes</i> . |
| .182 | 7.4 | .... | .... | VIII | No <i>comes</i> . |

O Σ 159, 15 LYNCS

R. A., 6h 48m.6

Dec., +58° 33'

| | | | | | |
|----------|------|-------|------|--------|-----------|
| 1902.223 | 9.3 | 16.6 | 0.76 | III | Poor obs. |
| .297 | 10.1 | 9.5 | 0.87 | VII | |
| 1903.146 | 8.5 | 4.1 | 0.81 | VIII | Good. |
| .149 | 8.9 | 10.2 | 0.91 | VIII | Good. |
| .168 | 7.4 | 15.9 | 0.76 | VIII | Blurred. |
| 1902.260 | 2 n | 13.05 | 0.82 | Means. | |
| 1903.154 | 3 n | 10.07 | 0.83 | | |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece. | Remarks. |
|-------|----------|----------|----------|-----------|----------|
| | <i>h</i> | <i>o</i> | <i>u</i> | | |

Σ 1110, CASTOR

R. A., 7h 28m.2

Dec., +32° 6'

| | | | | | |
|----------|------|--------|------|--------|---------------|
| 1897.274 | 9.1 | 229.1 | 5.86 | III | Diffuse. |
| .288 | 8.6 | 226.9 | 5.69 | IV | Very diffuse. |
| .342 | 10.8 | 227.6 | 5.71 | III | |
| 1899.252 | 8.6 | 227.8 | 5.41 | VII | Blazing. |
| .277 | 8.8 | 226.5 | 5.54 | V | Good. |
| .285 | 9.0 | 226.2 | 5.62 | V | Good. |
| 1901.299 | 9.1 | 227.1 | 5.81 | X | |
| .307 | 9.3 | 227.1 | 5.77 | X | |
| .315 | 9.4 | 226.1 | 5.67 | VII | Blazing. |
| 1902.226 | 8.5 | 225.6 | 5.88 | X | Good. |
| .234 | 8.9 | 224.4 | 5.86 | X | |
| .253 | 9.2 | 226.0 | 5.62 | X | |
| 1903.305 | 9.4 | 225.3 | 5.77 | V | |
| .313 | 9.7 | 224.9 | 5.75 | V | Good. |
| 1906.226 | 8.2 | 221.9 | 5.81 | VI | |
| .247 | 8.5 | 223.6 | 5.65 | V | Good. |
| 1897.301 | 3 n | 227.87 | 5.75 | Means. | |
| 1899.271 | 3 n | 226.83 | 5.52 | | |
| 1901.307 | 3 n | 226.77 | 5.75 | | |
| 1902.238 | 3 n | 225.33 | 5.78 | | |
| 1903.309 | 2 n | 225.10 | 5.76 | | |
| 1906.236 | 2 n | 222.75 | 5.73 | | |

Δ 1126²

R. A., 7h 34m.4

Dec., +5° 28'

| | | | | | |
|----------|-----|-------|------|-----|-------|
| 1902.223 | 8.4 | 188.6 | 0.80 | III | Good. |
|----------|-----|-------|------|-----|-------|

OBSERVATIONS OF DOUBLE STARS.

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece. | Remarks. |
|-------|----------|----------|----------|------------|----------|
| | <i>h</i> | <i>o</i> | <i>s</i> | | |

 β 101, 9 ARGUSR. A., 7^h 47^m.1

Dec., -13° 38'

| | | | | | |
|----------|------------|--------|------|--------|-------------------------|
| 1903.146 | 8.7 | 307.1 | 0.49 | VIII | Blurred. Not separated. |
| .149 | 7.8 | 301.6 | 0.53 | VIII | |
| .152 | 8.1 | 315.3 | 0.46 | VIII | |
| 1906.247 | 8.8 | 322.4 | | VIII | Elongated in 300°. |
| 1903.149 | 3 <i>n</i> | 308.00 | 0.49 | Means. | |
| 1906.247 | 1 <i>n</i> | 322.40 | ... | | |

 α 185R. A., 7^h 52^m.1

Dec., +1° 24'

| | | | | | |
|----------|------------|-------|------------------|--------|------------------------|
| 1902.223 | 9.1 | 21.2 | 0.48 | VII | Notched. |
| .297 | 9.7 | 26.1 | 0.40 <i>est.</i> | VII | Elongated. Blurred. |
| 1903.149 | 8.0 | 19.3 | 0.40 | VIII | Blurred. Elongated. |
| .168 | 7.6 | 18.9 | 0.49 | VIII | |
| .182 | 7.6 | 21.4 | 0.36 | VIII | |
| 1906.174 | 7.7 | 26.9 | 0.43 | VII | |
| .247 | 8.9 | 27.7 | 0.38 | VII | |
| 1902.260 | 2 <i>n</i> | 23.65 | 0.44 | Means. | |
| 1903.166 | 3 <i>n</i> | 19.87 | 0.42 | | |
| 1906.210 | 2 <i>n</i> | 27.30 | 0.40 | | |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece. | Remarks. |
|-------|----------|----------|----------|-----------|----------|
| | <i>h</i> | <i>o</i> | <i>r</i> | | |

 β 581, A B.

R. A., 7h 58m.6

Dec., +12° 35'

| | | | | | |
|----------|------|--------|------------------|--------|------------------------|
| 1897.296 | 10.2 | 280.4 | 0.42 | IV | |
| .370 | 12.2 | 90.6 | 0.48 | IV | Blurred but separated. |
| 1898.246 | 9.2 | 280.8 | 0.50 | IV | |
| .263 | 9.3 | 280.3 | 0.48 | IV | |
| 1899.255 | 9.1 | 279.4 | 0.57 | VIII | Good. |
| .266 | 9.3 | 286.1 | 0.61 | VII | Good. |
| 1902.297 | 9.5 | 283.0 | 0.40 <i>est.</i> | VII | Elongated. |
| 1903.146 | 9.0 | 123.3 | 0.32 | VIII | Elongated. |
| .149 | 8.2 | 300.2 | 0.39 | VIII | |
| .152 | 8.3 | 306.4 | 0.32 | VIII | Separated by glimpses. |
| 1906.247 | 9.2 | ..... | .... | .... | Elongated in 310°. |
| .289 | 9.5 | 330.4 | 0.3± | VII | Elongated. |
| 1897.333 | 2 n | 275.50 | 0.45 | Means. | |
| 1898.255 | 2 n | 280.55 | 0.49 | | |
| 1899.280 | 2 n | 282.75 | 0.59 | | |
| 1902.297 | 1 n | 283.00 | 0.40 | | |
| 1903.149 | 3 n | 303.30 | 0.34 | | |
| 1906.289 | 1 n | 330.40 | 0.30 | | |

 β 581, $\frac{1}{2}(A+B)$, C.

R. A., 7h 58m.6

Dec., +12° 35'

| | | | | | |
|----------|------|-------|------|----|-------|
| 1897.370 | 12.2 | 199.4 | 4.73 | V | |
| 1898.246 | 9.4 | 194.8 | 4.74 | IV | |
| .263 | 9.5 | 192.3 | 4.59 | IV | |
| 1899.255 | 9.2 | 191.7 | 4.53 | V | |
| .266 | 9.4 | 195.1 | 4.63 | V. | Good. |

OBSERVATIONS OF DOUBLE STARS.

| Date. | Sid. T. | p | s | Eyepiece. | Remarks. |
|-------|---------|-----|-----|-----------|----------|
| | h | o | . | | |

 β 581, $\frac{1}{2}(A+B)$, C.—Continued.

| | | | | | |
|----------|-----|--------|------|--------|------------|
| 1902.234 | 7.9 | 193.3 | 4.62 | X | Good. |
| .297 | 9.4 | 196.3 | 4.55 | VI | |
| 1906.247 | 9.2 | 196.7 | 4.88 | VII | |
| .289 | 9.4 | 194.5 | 4.49 | VII | Difficult. |
| 1897.370 | 1 n | 199.40 | 4.73 | Means. | |
| 1898.255 | 2 n | 193.55 | 4.66 | | |
| 1899.260 | 2 n | 193.40 | 4.58 | | |
| 1902.265 | 2 n | 194.80 | 4.58 | | |
| 1906.268 | 2 n | 195.60 | 4.68 | | |

 Σ 1196, ζ CANCRI, A B.

R. A., 8h 6m.5

Dec., $+17^{\circ} 57'$

| | | | | | |
|----------|-----|------|------|------|---------------|
| 1897.274 | 8.6 | 12.9 | 1.25 | IV | Blurred. |
| .288 | 8.8 | 13.5 | 1.14 | IV | Blurred. |
| .291 | 9.5 | 9.9 | 1.09 | IV | Blurred. |
| .296 | 9.2 | 14.8 | 1.25 | IV | |
| 1898.241 | 9.7 | 11.7 | 1.30 | IV | |
| .246 | 8.8 | 11.5 | 1.26 | IV | |
| .249 | 9.1 | 12.1 | 1.22 | IV | |
| .309 | 9.8 | 11.4 | 1.11 | IV | Blurred. |
| 1899.239 | 7.9 | 5.9 | 0.88 | VIII | Very blurred. |
| .252 | 8.1 | 7.7 | 1.01 | VII | Poor seeing. |
| .255 | 8.5 | 4.8 | 1.10 | VIII | Good. |
| .266 | 8.5 | 6.4 | 1.21 | VII | Good. |
| 1901.266 | 8.7 | 0.7 | 1.10 | VII | |
| .299 | 9.5 | 0.6 | 0.89 | VIII | |
| .307 | 9.8 | 1.9 | 1.18 | VII | |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece. | Remarks. |
|---------------------------|----------|----------|----------|-----------|-----------------|
| | <i>h</i> | <i>o</i> | <i>r</i> | | |
| ζ CANCRI, A B.—Continued. | | | | | |
| 1901.315 | 10.0 | 6.0 | 0.99 | VII | |
| .323 | 9.7 | 1.7 | 1.18 | VI | Good. |
| 1902.149 | 7.9 | 357.6 | 1.14 | VII | |
| .171 | 8.3 | 360.7 | 0.97 | VIII | Blurred. |
| .223 | 8.6 | 360.5 | 1.31 | VII | Good. |
| .226 | 8.8 | 359.1 | 1.14 | VI | |
| .253 | 8.6 | 360.2 | 0.95 | VI | |
| 1903.146 | 9.1 | 357.7 | 1.31 | VIII | Unsteady. |
| .149 | 8.6 | 354.6 | 1.27 | VIII | |
| .152 | 8.5 | 356.1 | 1.22 | VIII | |
| .168 | 7.7 | 356.3 | 1.11 | VIII | Through clouds. |
| 1904.223 | 8.3 | 362.9 | 1.06 | VI | |
| .237 | 9.8 | 354.2 | 1.25 | VII | Blurred. |
| .259 | 9.5 | 354.3 | 1.33 | VII | |
| 1906.174 | 8.0 | 346.0 | 1.34 | VI | |
| .226 | 8.4 | 347.1 | 1.26 | VI | |
| .247 | 9.6 | 344.5 | 1.16 | VII | |
| .289 | 9.7 | 348.1 | 1.31 | VII | Good. |
| 1897.287 | 4 n | 12.78 | 1.18 | Means. | |
| 1898.261 | 4 n | 11.67 | 1.22 | | |
| 1899.253 | 4 n | 6.20 | 1.05 | | |
| 1901.302 | 5 n | 2.18 | 1.07 | | |
| 1902.204 | 5 n | 359.62 | 1.10 | | |
| 1903.154 | 5 n | 356.18 | 1.23 | | |
| 1904.240 | 3 n | 353.80 | 1.21 | | |
| 1906.229 | 4 n | 346.42 | 1.27 | | |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece. | Remarks. |
|-------|----------|----------|----------|-----------|----------|
| | <i>h</i> | <i>o</i> | <i>r</i> | | |

ζ CANCRI, A C.

R. A., 8^h 6^m.5

Dec., +17° 57'

| | | | | | |
|----------|------|-------|------|------|---------------|
| 1897.274 | 8.7 | 115.1 | 5.26 | IV | Blurred. |
| .288 | 9.0 | 115.7 | 5.19 | IV | Blurred. |
| .291 | 9.6 | 116.2 | 5.31 | IV | Blurred. |
| .296 | 9.4 | 117.2 | 5.31 | IV | |
| 1898.241 | 9.9 | 116.8 | 5.37 | IV | |
| .246 | 9.0 | 117.0 | 5.36 | IV | |
| .249 | 9.3 | 117.0 | 5.48 | IV | |
| .309 | 10.0 | 117.5 | 5.32 | IV | Blurred. |
| 1899.239 | 8.0 | 114.0 | 5.38 | VIII | Very blurred. |
| .252 | 8.2 | 114.8 | 5.30 | VII | Poor seeing. |
| .255 | 8.5 | 117.0 | 5.38 | VIII | Good. |
| .266 | 8.6 | 115.7 | 5.35 | VII | Good. |
| 1901.266 | 9.0 | 114.6 | 5.53 | VII | |
| .299 | 9.6 | 115.7 | 5.28 | VIII | |
| .307 | 10.0 | 114.8 | 5.41 | VII | |
| .315 | 10.2 | 116.0 | 5.53 | VII | |
| 1902.149 | 8.1 | 112.5 | 5.48 | VII | |
| .171 | 8.5 | 113.4 | 5.45 | VIII | |
| .223 | 8.7 | 113.6 | 5.49 | VII | |
| .226 | 9.0 | 112.2 | 5.33 | VI | |
| .253 | 8.8 | 115.3 | 5.42 | VI | |
| 1903.146 | 9.3 | 111.0 | 5.35 | VIII | |
| .149 | 8.7 | 114.5 | 5.42 | VII | |
| .152 | 8.6 | 113.1 | 5.33 | VI | |
| .168 | 7.9 | 111.0 | 5.48 | VIII | |
| 1904.223 | 8.5 | 109.9 | 5.65 | VI | |
| .237 | 9.9 | 111.6 | 5.48 | VII | |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece. | Remarks. |
|-------|----------|----------|----------|-----------|----------|
| | <i>h</i> | <i>o</i> | <i>u</i> | | |

ζ CANCRI, A C.—Continued.

| | | | | | |
|----------|------------|--------|------|-------|--|
| 1904.259 | 9.6 | 111.2 | 5.29 | VII | |
| 1906.174 | 8.1 | 107.8 | 5.54 | VI | |
| .226 | 8.6 | 109.4 | 5.42 | VI | |
| .247 | 9.7 | 110.4 | 5.30 | VII | |
| .289 | 9.8 | 108.9 | 5.45 | VII | |
| 1897.287 | 4 <i>n</i> | 116.05 | 5.27 | Mean. | |
| 1898.261 | 4 <i>n</i> | 117.08 | 5.38 | | |
| 1899.253 | 4 <i>n</i> | 115.38 | 5.35 | | |
| 1901.297 | 4 <i>n</i> | 115.28 | 5.44 | | |
| 1902.204 | 5 <i>n</i> | 113.40 | 5.43 | | |
| 1903.154 | 4 <i>n</i> | 112.40 | 5.40 | | |
| 1904.240 | 3 <i>n</i> | 110.90 | 5.47 | | |
| 1906.234 | 4 <i>n</i> | 109.12 | 5.43 | | |

Σ 1216

R. A., 8h 16m.3

Dec., -1° 17'

| | | | | | |
|----------|------|-------|------------------|------|-------------------------|
| 1897.296 | 9.6 | 191.3 | 0.40 <i>est.</i> | IV | Separated by glimpses. |
| .370 | 11.8 | 199.5 | 0.40 <i>est.</i> | IV | Not separated. Blurred. |
| 1898.246 | 9.6 | 193.3 | 0.48 | IV | Separated at times. |
| .249 | 9.5 | 193.0 | 0.53 | IV | Separated at times. |
| 1899.253 | 9.4 | 192.5 | 0.40 <i>est.</i> | VIII | Blurred. Not separated. |
| .266 | 9.1 | 191.2 | 0.49 | VIII | |
| 1901.307 | 10.7 | 192.3 | 0.58 | VII | |
| .323 | 10.0 | 193.5 | 0.51 | VII | Separated. |
| 1902.149 | 8.4 | 193.0 | 0.30 <i>est.</i> | VII | Not separated. |
| .297 | 9.8 | 191.0 | 0.44 | VII | Elongated. |

4 OBS.

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece. | Remarks. |
|-------|----------|----------|----------|------------|----------|
| | <i>h</i> | <i>o</i> | <i>r</i> | | |

Σ 1216—Continued.

| | | | | | |
|----------|------------|--------|------|--------|---------------------------------------|
| 1903.149 | 8.3 | 195.0 | 0.37 | VIII | Elongated. Blurred. Not separated. |
| .182 | 7.9 | 188.6 | 0.36 | VIII | |
| .292 | 9.2 | 196.1 | 0.34 | VII | |
| 1897.333 | 2 <i>n</i> | 195.40 | 0.40 | Means. | |
| 1898.248 | 2 <i>n</i> | 193.15 | 0.50 | | |
| 1899.260 | 2 <i>n</i> | 191.85 | 0.45 | | |
| 1901.315 | 2 <i>n</i> | 192.90 | 0.54 | | |
| 1902.223 | 2 <i>n</i> | 192.00 | 0.37 | | |
| 1903.208 | 3 <i>n</i> | 193.23 | 0.36 | | |

β 208

R. A., 8^h 34^m.8

Dec., -22° 20'

| | | | | | |
|----------|-----|-------|------------------|------|-----------------------|
| 1603.182 | 8.0 | 160.6 | 0.30 <i>est.</i> | VIII | Elongated. Difficult. |
| .292 | 9.0 | | | | Cannot. |

Σ 1273, ε HYDRAE, A B.

R. A., 8^h 41^m.5

Dec., +6° 47'

| | | | | | |
|----------|------|-------|------------------|------|-----------------------------|
| 1899.255 | 9.6 | 260.4 | 0.20 <i>est.</i> | VIII | Very slightly elongated. |
| .312 | 9.7 | 254.2 | 0.20 <i>est.</i> | VIII | Surely elongated. |
| 1901.323 | 10.2 | .... | .... | .... | No elongation. |
| 1902.297 | 10.0 | .... | .... | .... | Not sure of any elongation. |
| 1903.149 | 8.4 | 125.9 | 0.20 <i>est.</i> | VIII | Elongated. |
| .152 | 8.8 | .... | .... | .... | Suspect elongation in 100° |
| .182 | 8.2 | .... | .... | .... | No certain elongation. |
| .292 | 8.9 | 140.6 | 0.29 | VII | Certainly elongated. |
| .305 | 9.6 | 145.0 | 0.25 <i>est.</i> | VIII | Elongated. |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece. | Remarks. |
|-------|----------|----------|----------|-----------|----------|
| | <i>h</i> | <i>o</i> | <i>r</i> | | |

ε HYDRAE, A B.—Continued.

| | | | | | |
|----------|------------|--------|------|--------|--|
| 1899.284 | 2 <i>n</i> | 257.30 | 0.20 | Means. | |
| 1903.249 | 3 <i>n</i> | 137.17 | 0.25 | | |

Σ 1273, ε HYDRAE

R. A., 8^h 40^m.4

Dec., +6° 52'

| | | | | | |
|----------|------------|--------|------|--------|----------|
| 1897.348 | 10.8 | 235.2 | 3.29 | IV | Blazing. |
| .367 | 11.1 | 231.3 | 3.31 | III | |
| 1901.323 | 10.2 | 235.2 | 3.27 | VI | |
| .337 | 10.0 | 233.1 | 3.09 | VI | |
| 1897.358 | 2 <i>n</i> | 233.25 | 3.30 | Means. | |
| 1901.330 | 2 <i>n</i> | 234.30 | 3.18 | | |

Σ 3121

R. A., 9^h 12^m.0

Dec., +29° 0'

| | | | | | |
|----------|------|-------|------|------|----------------|
| 1897.296 | 10.5 | 196.1 | 0.75 | IV | Good. Good. |
| .342 | 11.7 | 14.9 | 0.62 | IV | |
| .367 | 11.3 | 16.0 | 0.62 | IV | |
| 1898.263 | 9.8 | 15.8 | 0.65 | IV | |
| .309 | 10.9 | 198.0 | 0.76 | VIII | |
| 1899.255 | 9.8 | 197.3 | 0.67 | VII | |
| .266 | 10.8 | 202.8 | 0.73 | VII | |
| .288 | 9.2 | 197.2 | 0.67 | VII | |
| 1901.266 | 9.7 | 20.6 | 0.73 | VII | |
| .299 | 10.2 | 201.0 | 0.68 | VIII | |
| .323 | 10.6 | 23.1 | 0.76 | VI | |
| 1902.149 | 8.6 | 23.0 | 0.83 | VII | |

| Date. | Sid. T. | p | s | Eyepiece. | Remarks. |
|-------|---------|-----|-----|-----------|----------|
| | h | ° | ' | | |

Σ 3121—Continued.

| | | | | | |
|----------|------|--------|------|--------|-------|
| 1902.226 | 9.2 | 22.5 | 0.78 | VI | Good. |
| .253 | 9.5 | 23.7 | 0.72 | VI | |
| 1903.240 | 8.5 | 23.1 | 0.72 | VII | |
| .305 | 9.7 | 202.8 | 0.60 | VIII | Good. |
| .313 | 10.0 | 23.8 | 0.56 | VIII | |
| 1906.289 | 10.0 | 213.3 | 0.82 | VII | |
| 1897.335 | 3 n | 195.33 | 0.66 | Means. | |
| 1898.286 | 2 n | 196.90 | 0.70 | | |
| 1899.270 | 3 n | 199.10 | 0.69 | | |
| 1901.296 | 3 n | 201.57 | 0.72 | | |
| 1902.209 | 3 n | 203.07 | 0.78 | | |
| 1903.286 | 3 n | 203.23 | 0.63 | | |

Σ 1338

R. A., 9h 14m.7

Dec., +38° 37'

| | | | | | |
|----------|------|-------|------|-----|----------|
| 1897.291 | 10.7 | 164.0 | 1.64 | IV | Good. |
| .296 | 11.4 | 164.0 | 1.69 | IV | |
| .342 | 11.5 | 163.5 | 1.52 | III | Good. |
| 1898.271 | 11.2 | 164.3 | 1.46 | IV | Good. |
| .309 | 11.4 | 164.9 | 1.59 | IV | |
| .312 | 10.8 | 164.5 | 1.45 | IV | |
| 1901.395 | 12.0 | 165.7 | 1.66 | VI | |
| .416 | 13.3 | 165.8 | 1.61 | VII | Good. |
| .422 | 13.7 | 165.4 | 1.30 | III | Blurred. |
| 1902.269 | 8.3 | 165.7 | 1.70 | VI | |
| .297 | 10.9 | 167.4 | 1.73 | VI | |
| .357 | 12.1 | 167.1 | 1.71 | VII | Good. |
| 1903.313 | 10.7 | 168.5 | 1.63 | VI | |
| .316 | 10.4 | 168.2 | 1.54 | VII | |
| .349 | 11.4 | 166.7 | 1.57 | VI | |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece. | Remarks. |
|-------|----------|----------|----------|-----------|----------|
| | <i>h</i> | <i>o</i> | <i>'</i> | | |

Σ 1338—Continued.

| | | | | | |
|----------|------------|--------|------|--------|--|
| 1897.310 | 3 <i>n</i> | 163.83 | 1.62 | Means. | |
| 1898.297 | 3 <i>n</i> | 164.57 | 1.50 | | |
| 1901.411 | 3 <i>n</i> | 165.63 | 1.52 | | |
| 1902.308 | 3 <i>n</i> | 166.73 | 1.71 | | |
| 1903.326 | 3 <i>n</i> | 167.80 | 1.58 | | |

Σ 1356, ω LEONIS

R. A., 9h 23m.1

Dec., +9° 30'

| | | | | | |
|----------|------|-------|------|------|---------------|
| 1897.288 | 9.5 | 108.3 | 0.88 | IV | Blurred. |
| .291 | 10.5 | 108.2 | 0.69 | IV | |
| .296 | 10.8 | 110.1 | 0.88 | IV | Good. |
| 1898.241 | 9.3 | 108.2 | 0.81 | IV | Fair. |
| .252 | 8.5 | 109.7 | 0.70 | IV | |
| .309 | 10.4 | 109.6 | 0.71 | IV | Good. |
| 1899.252 | 9.0 | 110.6 | 0.77 | VII | |
| .255 | 10.2 | 110.5 | 0.87 | VIII | Good. |
| .312 | 9.9 | 110.4 | 0.76 | VIII | Good. |
| 1901.299 | 9.9 | 114.2 | 0.72 | VIII | |
| .315 | 10.8 | 114.9 | 0.82 | VII | Blurred. |
| .318 | 12.0 | 114.5 | 0.87 | VII | Blurred. |
| .323 | 11.1 | 113.0 | 0.85 | VII | |
| 1902.223 | 10.1 | 115.0 | 0.95 | VI | Very blurred. |
| .226 | 9.5 | 112.7 | 0.86 | VI | |
| .269 | 9.0 | 114.4 | 0.95 | VII | Blurred. |
| 1903.152 | 9.0 | 116.0 | 0.95 | VI | X inch. |
| .240 | 8.7 | 118.3 | 1.08 | VI | Blurred. |
| .292 | 9.4 | 116.2 | 0.92 | VIII | Good. |
| 1906.289 | 10.2 | 117.8 | 0.82 | VII | |

OBSERVATIONS OF DOUBLE STARS.

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece. | Remarks. |
|-------|----------|----------|----------|-----------|----------|
| | <i>h</i> | <i>o</i> | <i>s</i> | | |

 ω LEONIS—Continued.

| | | | | | |
|----------|------------|--------|------|--------|--|
| 1897.292 | 3 <i>n</i> | 108.87 | 0.82 | Means. | |
| 1898.267 | 3 <i>n</i> | 109.17 | 0.74 | | |
| 1899.273 | 3 <i>n</i> | 110.50 | 0.80 | | |
| 1901.314 | 4 <i>n</i> | 114.15 | 0.81 | | |
| 1902.239 | 3 <i>n</i> | 114.03 | 0.92 | | |
| 1903.228 | 3 <i>n</i> | 116.83 | 0.98 | | |
| 1906.289 | 1 <i>n</i> | 117.80 | 0.82 | | |

 α 208, ϕ URSAE MAJORIS

R. A., 9h 45m.3

Dec., +54° 32'

| | | | | | |
|----------|------|-------|------------------|------|-------------------------|
| 1897.367 | 11.5 | 98.1 | 0.30 <i>est.</i> | IV | Notched. |
| .370 | 12.3 | 93.1 | 0.30 <i>est.</i> | IV | Elongated. |
| .447 | 13.7 | 97.0 | 0.30 <i>est.</i> | IV | Not separated. Blurred. |
| 1898.249 | 8.4 | 99.2 | 0.30 <i>est.</i> | IV | Elongated. |
| .271 | .... | .... | .... | .... | Single (?) |
| .309 | 11.7 | 102.1 | 0.30 <i>est.</i> | IV | Elongated. |
| 1899.255 | 10.7 | 97.0 | 0.30 <i>est.</i> | VIII | Elongated. |
| .312 | 11.3 | 96.8 | 0.35 <i>est.</i> | VIII | Notched. |
| 1901.395 | 12.2 | 281.8 | 0.31 | VIII | Notched. |
| .416 | 13.1 | 283.3 | 0.35 <i>est.</i> | VIII | Not separated. |
| .441 | 14.0 | 285.8 | 0.41 | VII | Notched. |
| 1902.269 | 8.5 | 107.6 | 0.30 <i>est.</i> | VII | Elongated. |
| .357 | 12.3 | 288.0 | 0.40 | VII | Notched. |
| .483 | 14.5 | .... | .... | .... | Cannot. |
| 1903.313 | 10.8 | 289.6 | 0.30 <i>est.</i> | VII | Elongated. |
| .316 | 10.8 | 293.0 | 0.30 <i>est.</i> | VII | Notched. |
| .349 | 11.6 | 109.3 | 0.30 <i>est.</i> | VIII | Notched. |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece. | Remarks. |
|-------|----------|----------|----------|-----------|----------|
| | <i>h</i> | <i>o</i> | <i>.</i> | | |

♄ URSAE MAJORIS—Continued.

| | | | | | |
|----------|------------|--------|------|--------|--|
| 1897.395 | 3 <i>n</i> | 96.07 | 0.30 | Means. | |
| 1898.279 | 2 <i>n</i> | 100.65 | 0.30 | | |
| 1899.284 | 2 <i>n</i> | 96.90 | 0.32 | | |
| 1901.417 | 3 <i>n</i> | 103.63 | 0.36 | | |
| 1902.314 | 2 <i>n</i> | 107.80 | 0.35 | | |
| 1903.326 | 3 <i>n</i> | 110.63 | 0.30 | | |

8 SEXTANTIS

R. A., 9^h 46^m.6

Dec., -7° 32'

| | | | | | |
|------------|------|-------|------------------|------|-------------------------|
| ■ 1897.296 | 9.8 | 93.0 | 0.35 <i>est.</i> | IV | Not surely separated. |
| .370 | 11.2 | 96.6 | 0.38 | IV | Blazing. |
| 1898.263 | 9.9 | 94.4 | 0.50 <i>est.</i> | IV | Very blurred. |
| .271 | 11.8 | 93.5 | 0.38 | IV | Difficult. |
| .309 | 10.6 | 91.2 | 0.39 | IV | |
| .323 | 10.2 | 92.8 | 0.42 | IV | |
| 1899.255 | 10.0 | 268.6 | 0.44 | VIII | |
| .312 | 10.1 | 85.6 | 0.42 | VIII | Good. |
| 1901.299 | 10.4 | 85.5 | 0.45 | VIII | |
| .323 | 10.9 | 86.5 | 0.55 | VII | Separated. Good. |
| .381 | 11.7 | 89.1 | 0.50 | VII | Blazing. Not separated. |
| .395 | 11.8 | 86.6 | 0.39 | VII | Separated. |
| 1902.297 | 10.1 | 87.0 | 0.44 | VII | Just separated. |
| .357 | 11.0 | 83.2 | 0.51 | VII | |
| 1903.152 | 9.2 | 76.9 | 0.51 | VI | Elongated, X inch. |
| .182 | 8.3 | 83.6 | 0.45 | VIII | |
| .292 | 9.6 | 82.2 | 0.45 | VIII | |
| 1906.247 | 9.8 | 77.6 | 0.60 | VII | |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece. | Remarks. |
|-------|---------|----------|----------|-----------|----------|
| | h | o | ' | | |

8 SEXTANTIS—Continued.

| | | | | | |
|----------|------------|-------|------|--------|--|
| 1897.333 | 2 <i>n</i> | 94.80 | 0.37 | Means. | |
| 1898.292 | 4 <i>n</i> | 92.98 | 0.42 | | |
| 1899.284 | 2 <i>n</i> | 87.10 | 0.43 | | |
| 1901.350 | 4 <i>n</i> | 86.92 | 0.47 | | |
| 1902.327 | 2 <i>n</i> | 85.10 | 0.48 | | |
| 1903.209 | 3 <i>n</i> | 80.90 | 0.47 | | |
| 1906.247 | 1 <i>n</i> | 77.60 | 0.60 | | |

O Σ 215

R. A., 10h 10m.8

Dec., +18° 14'

| | | | | | |
|----------|------------|--------|------|--------|-------|
| 1902.253 | 9.7 | 25.0 | 0.98 | VI | |
| .269 | 9.2 | 204.8 | 0.98 | VII | |
| .297 | 10.4 | 204.2 | 0.96 | VI | Good. |
| 1903.240 | 8.9 | 205.3 | 0.89 | VII | |
| .305 | 10.0 | 206.7 | 0.75 | VIII | |
| .313 | 10.2 | 204.7 | 0.76 | VIII | |
| 1906.289 | 10.4 | 205.8 | 0.78 | VII | Good. |
| 1902.273 | 3 <i>n</i> | 204.67 | 0.97 | Means. | |
| 1903.286 | 3 <i>n</i> | 205.57 | 0.80 | | |
| 1906.289 | 1 <i>n</i> | 205.80 | 0.78 | | |

 Σ 1424, γ LEONIS

R. A., 10h 14m.4

Dec., +20° 21'

| | | | | | |
|----------|------|-------|------|-----|-----------------------|
| 1902.398 | 11.9 | 115.2 | 3.61 | V | Through clouds. Good. |
| .480 | 14.4 | 115.2 | 3.75 | V | |
| 1903.240 | 9.3 | 115.3 | 3.78 | VII | |
| .338 | 11.0 | 113.1 | 3.67 | V | |
| .349 | 11.9 | 115.2 | 3.68 | V | |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece. | Remarks. |
|-------|----------|----------|----------|-----------|----------|
| | <i>h</i> | <i>o</i> | <i>o</i> | | |

 γ LEONIS—Continued.

| | | | | | |
|----------|------------|--------|------|--------|--|
| 1904.371 | 14.1 | 119.8 | 4.42 | X | |
| .472 | 14.8 | 118.0 | 3.83 | X | |
| 1902.439 | 2 <i>n</i> | 115.20 | 3.68 | Means. | |
| 1903.316 | 3 <i>n</i> | 114.53 | 3.71 | | |
| 1904.422 | 2 <i>n</i> | 117.67 | 3.98 | | |

R. A., 10^h 17^m.4O Σ 216

Dec., +15° 51'

| | | | | | |
|----------|------------|--------|------|--------|--------------|
| 1902.297 | 10.3 | 113.1 | 1.31 | VI | |
| .357 | 11.2 | 113.2 | 1.15 | V | |
| 1903.182 | 9.3 | 115.7 | 1.03 | III | |
| .313 | 10.4 | 113.3 | 1.19 | VI | |
| .316 | 10.6 | 110.6 | 1.12 | VII | Fine seeing. |
| 1906.289 | 10.6 | 104.0 | 1.46 | VII | |
| 1902.327 | 2 <i>n</i> | 113.15 | 1.23 | Means. | |
| 1903.270 | 3 <i>n</i> | 113.20 | 1.11 | | |
| 1906.289 | 1 <i>n</i> | 104.00 | 1.46 | | |

R. A., 10^h 34^m.5O Σ 224

Dec., +9° 22'

| | | | | | |
|----------|------|-------|------------------|------|------------------------|
| 1897.296 | 10.9 | 314.0 | 0.40 <i>est.</i> | IV | |
| .342 | 12.0 | 307.3 | 0.49 | IV | Difficult. |
| .348 | 11.8 | 306.0 | 0.43 | IV | Difficult. |
| 1901.416 | 12.9 | 299.5 | 0.52 | VII | |
| 1902.297 | 10.6 | 295.9 | 0.40 <i>est.</i> | VI | Wedge. |
| .357 | 11.4 | 297.3 | 0.56 | VII | Separated. |
| 1903.182 | 8.5 | 300.8 | 0.30 <i>est.</i> | VIII | |
| .292 | 9.8 | 301.4 | 0.37 | VIII | |
| .305 | 10.3 | 310.6 | 0.30 <i>est.</i> | VIII | Separated by glimpses. |

5 OBS.

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece. | Remarks. |
|-------|---------|----------|----------|------------|----------|
| | h | o | . | | |

OS 224—Continued.

| | | | | | |
|----------|-----|--------|------|--------|--|
| 1897.329 | 3 n | 309.10 | 0.44 | Means. | |
| 1901.416 | 1 n | 299.50 | 0.52 | | |
| 1902.327 | 2 n | 296.60 | 0.48 | | |
| 1903.260 | 3 n | 304.27 | 0.32 | | |

 β 1077, α URSAE MAJORISR. A., 10^h 57^m.6

Dec., +62° 17'

| | | | | | |
|----------|------|--------|------------------|-------------|---|
| 1898.246 | 10.7 | 294.7 | 0.8 <i>est.</i> | IV | Thro' clouds. Very faint and difficult. |
| .249 | 8.1 | 292.4 | 0.97 | IV | Good. |
| 1899.252 | 9.3 | 286.9 | 0.70 | VIII | Very difficult. |
| .312 | 10.5 | 286.1 | 0.97 | VIII | Good. |
| .540 | 16.2 | 277.2 | 0.86 | VIII | Good. |
| 1901.447 | 14.8 | .... | Single under | all powers. | Good seeing. |
| .452 | 13.4 | .... | .... | .... | No companion. |
| .469 | 14.0 | .... | .... | .... | Single. |
| 1902.297 | .... | .... | No companion. | | Blurred. |
| .357 | 12.4 | .... | .... | .... | Single. |
| .483 | 14.5 | .... | Favorable con | ditions. | No companion. |
| 1903.149 | 9.0 | .... | .... | Fine seeing | but no companion visible. |
| .316 | 11.5 | 272.1 | 0.60 <i>est.</i> | VII | Very difficult. |
| 1904.530 | 15.5 | .... | .... | .... | Cannot see companion. |
| 1906.247 | 10.1 | .... | .... | .... | Cannot see companion. |
| 1898.248 | 2 n | 293.55 | 0.89 | Means. | |
| 1899.368 | 3 n | 283.40 | 0.84 | | |
| 1903.316 | 1 n | 272.10 | 0.60 | | |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece. | Remarks. |
|-----------------|------------|----------|------------------|-----------|------------------------|
| | <i>h</i> | <i>o</i> | <i>.</i> | | |
| Σ 1517 | | | | | |
| R. A., 11h 8m.4 | | | Dec., +20° 41' | | |
| 1897.296 | 11.1 | 92.5 | 0.51 | IV | Good. |
| .348 | 12.0 | 94.6 | 0.47 | IV | |
| 1898.271 | 12.0 | 273.8 | 0.44 | IV | Good. |
| .309 | 11.1 | 93.2 | 0.43 | IV | |
| .320 | 10.1 | 92.9 | 0.50 | IV | |
| 1899.312 | 11.7 | 91.4 | 0.50 | VIII | |
| 1901.318 | 13.4 | 275.3 | 0.50 | VII | Not separated. |
| .370 | 13.5 | 90.6 | 0.42 | VIII | Good. |
| .416 | 12.7 | 93.2 | 0.44 | VII | Good. |
| 1902.297 | 11.3 | 268.9 | 0.48 | VII | Just separated, |
| .357 | 11.7 | 91.9 | 0.44 | VII | Good. |
| 1903.182 | 9.0 | 92.4 | 0.41 | VIII | Barely separated. |
| .305 | 10.5 | 91.7 | 0.32 | VIII | Notched. |
| .313 | 11.1 | 84.8 | 0.39 | VII | Separated by glimpses. |
| 1906.492 | 14.8 | 72.7 | 0.25 <i>est.</i> | VII | Elongated. |
| 1897.322 | 2 <i>n</i> | 93.55 | 0.49 | Means. | |
| 1898.300 | 3 <i>n</i> | 93.30 | 0.46 | | |
| 1899.312 | 1 <i>n</i> | 91.40 | 0.50 | | |
| 1901.368 | 3 <i>n</i> | 93.03 | 0.45 | | |
| 1902.327 | 2 <i>n</i> | 91.07 | 0.46 | | |
| 1903.267 | 3 <i>n</i> | 89.63 | 0.36 | | |
| 1906.492 | 1 <i>n</i> | 72.70 | 0.25 | | |

 Σ 1523, ξ URSAE MAJORIS

R. A., 11h 12m.8

Dec., +32° 6'

| | | | | | |
|----------|------|-------|------|----|----------|
| 1897.334 | 13.1 | 165.2 | 2.05 | IV | |
| .370 | 11.5 | 165.6 | 2.01 | IV | |
| .447 | 13.5 | 162.5 | 2.04 | IV | Blurred. |
| 1898.246 | 10.4 | 160.9 | 2.03 | IV | Good. |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece. | Remarks. |
|-------|---------|----------|----------|------------|----------|
| | h | o | " | | |

ξ URSAE MAJORIS—Continued.

| | | | | | |
|----------|------|-------|------|------|-------------------|
| 1898.252 | 8.8 | 161.6 | 2.01 | IV | |
| .320 | 9.8 | 160.1 | 2.11 | IV | Good. |
| 1899.252 | 10.2 | 155.9 | 2.15 | VIII | Blazing. |
| .312 | 11.9 | 156.3 | 2.16 | VIII | Good. |
| 1901.318 | 12.3 | 146.7 | 2.59 | VII | Good. |
| .367 | 13.3 | 147.4 | 2.36 | VI | |
| .370 | 13.2 | 147.9 | 2.29 | VI | Good. |
| .395 | 12.9 | 147.6 | 2.38 | VI | Blazing. |
| .414 | 13.2 | 147.1 | 2.28 | III | Blurred. |
| 1902.357 | 13.0 | 143.7 | 2.37 | VI | |
| .398 | 12.1 | 145.1 | 2.43 | VI | Good. |
| .480 | 14.7 | 144.0 | 2.55 | VI | |
| .486 | 14.5 | 144.0 | 2.31 | III | Blazing. |
| 1903.240 | 9.5 | 143.5 | 2.45 | VII | |
| .305 | 11.2 | 144.2 | 2.48 | VIII | |
| .338 | 11.2 | 144.5 | 2.59 | III | |
| 1904.530 | 15.3 | 137.0 | 2.59 | III | |
| .560 | 16.4 | 137.8 | 2.67 | X | |
| .574 | 16.4 | 136.1 | 2.65 | VI | |
| 1906.289 | 11.0 | 133.2 | 2.50 | VII | |
| .492 | 14.3 | 132.9 | 2.52 | VI | |
| .495 | 15.0 | 132.6 | 2.70 | VII | Very poor seeing. |
| .498 | 14.7 | 133.4 | 2.52 | VII | |
| .508 | 15.0 | 132.8 | 2.63 | VII | |

| Date. | Sid. T. | p | s | Eyepiece. | Remarks. |
|-------|---------|-----|-----|-----------|----------|
| | h | o | ' | | |

ξ URSAE MAJORIS—Continued.

| | | | | | |
|----------|------------|--------|------|--------|--|
| 1897.384 | 3 <i>n</i> | 164.43 | 2.03 | Means. | |
| 1898.273 | 3 <i>n</i> | 160.87 | 2.05 | | |
| 1899.282 | 2 <i>n</i> | 156.10 | 2.16 | | |
| 1901.373 | 5 <i>n</i> | 147.34 | 2.38 | | |
| 1902.430 | 4 <i>n</i> | 144.20 | 2.42 | | |
| 1903.294 | 3 <i>n</i> | 144.07 | 2.51 | | |
| 1904.555 | 3 <i>n</i> | 136.97 | 2.64 | | |
| 1906.456 | 5 <i>n</i> | 132.98 | 2.57 | | |

OΞ 234

R. A., 11h 25m.4

Dec., +41° 50'

| | | | | | |
|----------|------------|--------|------------------|--------|------------------------|
| 1897.447 | 14.0 | 310.8 | 0.25 <i>est.</i> | IV | Not separated. |
| 1898.249 | 8.6 | 138.3 | 0.30 <i>est.</i> | IV | Elongated. |
| .408 | 13.2 | 302.8 | 0.35 <i>est.</i> | IV | Elongated. Blurred. |
| 1901.416 | 13.6 | 142.4 | 0.40 <i>est.</i> | VII | Not surely separated. |
| .447 | 14.2 | 141.6 | 0.44 | VII | Separated by glimpses. |
| .494 | 15.5 | 138.3 | 0.50 | VIII | Separated by glimpses. |
| 1902.357 | 12.6 | 139.6 | 0.30 <i>est.</i> | VII | Elongated. |
| .494 | 15.5 | 144.4 | 0.30 <i>est.</i> | VII | Elongated. Good. |
| 1903.182 | 8.7 | 145.2 | 0.41 | VIII | Separated. |
| .396 | 12.7 | 143.9 | 0.42 | VIII | Separated. |
| 1897.447 | 1 <i>n</i> | 130.80 | 0.25 | Means. | |
| 1898.328 | 2 <i>n</i> | 130.55 | 0.32 | | |
| 1901.452 | 3 <i>n</i> | 140.77 | 0.45 | | |
| 1902.425 | 2 <i>n</i> | 142.00 | 0.30 | | |
| 1903.289 | 2 <i>n</i> | 144.55 | 0.42 | | |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece. | Remarks. |
|-------|---------|----------|----------|------------|----------|
| | h | o | . | | |

O α 235

R. A., 11h 26m.7

Dec., +61° 38'

| | | | | | |
|----------|------|--------|------------------|--------|--------------------------|
| 1897.367 | 11.8 | 99.2 | 0.79 | IV | Confused images. |
| .370 | 12.7 | 277.2 | 0.92 | IV | Very blurred. |
| .447 | 14.2 | 104.3 | 0.73 | IV | Very difficult. |
| 1898.241 | 8.7 | 106.4 | 0.68 | IV | |
| 1899.252 | 9.5 | 107.7 | 0.60 | VIII | Blurred but separated. |
| .312 | 10.9 | 108.9 | 0.56 | VIII | Good. |
| .575 | 16.7 | 107.5 | 0.57 | VII | Very bad seeing. |
| 1901.370 | 13.8 | 124.8 | 0.52 | VII | Blurred. |
| .395 | 12.7 | 135.9 | 0.53 | VI | Poor observation. |
| .416 | 13.8 | 122.4 | 0.56 | VII | Separated by glimpses. |
| .447 | 14.4 | 121.6 | 0.48 | VII | Distinctly separated. |
| 1902.357 | 12.8 | .... | .... | .... | Suspect comes in 140°. |
| .494 | 15.7 | 133.7 | 0.40 <i>est.</i> | VII | Blurred; very difficult. |
| 1903.149 | 9.2 | 137.3 | 0.48 | VIII | |
| .182 | 8.8 | .... | .... | VIII | Cannot. |
| .396 | 12.9 | 143.3 | 0.35 <i>est.</i> | VIII | Blurred. Wedge. |
| 1906.247 | 10.3 | .... | .... | VII | Cannot. |
| 1897.395 | 3 n | 100.22 | 0.81 | Means. | |
| 1898.241 | 1 n | 106.40 | 0.68 | | |
| 1899.380 | 3 n | 108.03 | 0.58 | | |
| 1901.407 | 4 n | 126.18 | 0.52 | | |
| 1902.494 | 1 n | 133.70 | 0.40 | | |
| 1903.272 | 2 n | 140.30 | 0.42 | | |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece. | Remarks |
|-------|----------|----------|----------|------------|---------|
| | <i>h</i> | <i>o</i> | <i>·</i> | | |

 β 456R. A., 11^h 31^m.7

Dec., -11° 47'

| | | | | | |
|----------|------------|--------|------------------|-------|----------------------------|
| 1898.271 | 12.2 | 293.8 | 0.25 <i>est.</i> | IV | Elongated; very difficult. |
| .309 | 12.2 | 292.1 | 0.25 <i>est.</i> | IV | Wedge. |
| 1902.357 | 12.0 | ..... | .... |  | Single. Fine seeing. |
| 1903.313 | 11.3 | .... | .... |  | Cannot. |
| .316 | 11.4 | ..... | .... |  | Cannot. |
| 1898.290 | 2 <i>n</i> | 292.95 | 0.25 | Mean. | |

 β 794R. A., 11^h 48^m.2

Dec., +74° 20'

| | | | | | |
|----------|------------|------------------|------------------|--------|----------------------------------|
| 1897.367 | 12.0 | 160.1 | 0.40 <i>est.</i> | IV | Blurred. Not separated. |
| .447 | 14.5 | 147.6 | 0.25 <i>est.</i> | IV | Elongated. |
| 1896.241 | 8.9 | 156.0 | 0.49 | IV | Separated by glimpses. |
| .309 | 12.0 | 159.8 | 0.30 <i>est.</i> | IV | Wedge. |
| 1899.312 | 11.1 | 164.0 | 0.35 <i>est.</i> | VIII | Wedge. |
| .540 | 16.5 | 167.9 | 0.44 | VIII | Wedge. |
| 1901.370 | 14.0 | 170. <i>est.</i> | 0.25 <i>est.</i> | VII | Elongated. |
| .416 | 14.1 | 159. | 0.25 <i>est.</i> | VII | Slight elongation. |
| .447 | 15.1 | 176.4 | 0.25 <i>est.</i> | VII | Elongated. Difficult. |
| 1902.494 | 15.8 | ..... | .... | .... | Very slight elongation in 0°. |
| 1903.316 | 11.2 | 179.3 | 0.20 <i>est.</i> | VII | Wedge. |
| .396 | 13.0 | .... | .... | VIII | Cannot. |
| 1904.535 | 16.1 | ..... | .... | .... | Suspect elongation in 0°. |
| 1897.407 | 2 <i>n</i> | 153.85 | 0.32 | Means. | |
| 1898.275 | 2 <i>n</i> | 157.90 | 0.40 | | |
| 1899.426 | 2 <i>n</i> | 165.95 | 0.40 | | |
| 1901.411 | 3 <i>n</i> | 168.47 | 0.25 | | |
| 1903.316 | 1 <i>n</i> | 179.30 | 0.20 | | |

OBSERVATIONS OF DOUBLE STARS.

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece. | Remarks. |
|-------|---------|----------|----------|------------|----------|
| | h | o | " | | |

Σ 1639

R. A., 12^h 19^m.4

Dec., +26° 8'

| | | | | | |
|----------|------|-------|------------------|-------|--|
| 1898.271 | 12.4 | 358.5 | 0.25 <i>est.</i> | IV | Elongated. |
| 1899.537 | 15.7 | 15.8 | 0.25 <i>est.</i> | VII | Elongated. |
| .540 | 16.1 | 354.4 | 0.35 <i>est.</i> | VIII | Wedge shaped. |
| 1901.323 | 11.3 | .... | .... | .... | Suspect elongation in 0°. |
| .447 | 13.3 | .... | .... | .... | Suspect very ft. comes in 250°, 0°.4. |
| 1902.494 | 16.2 | .... | .... | .... | Suspect elongation in 0°. |
| 1903.316 | 11.5 | .... | .... | .... | Cannot. |
| 1899.116 | 3 n | 2.90 | 0.28 | Mean. | |

Σ 1670, γ VIRGINIS

R. A., 12^h 36^m.6

Dec., -0° 54'

| | | | | | |
|----------|------|-------|------|-----|-----------------------|
| 1897.441 | 13.7 | 150.9 | 5.65 | IV | Through clouds. |
| .465 | 14.5 | 327.7 | 5.56 | III | Blazing. |
| .515 | 15.3 | 148.4 | 5.68 | III | Good. |
| 1898.323 | 11.2 | 150.5 | 5.81 | IV | |
| .408 | 13.8 | 151.8 | 6.04 | V | Good. |
| 1899.436 | 13.4 | 330.6 | 5.78 | III | |
| .537 | 15.1 | 147.4 | 5.80 | VII | Daylight. |
| .540 | 15.3 | 327.9 | 5.88 | VII | |
| 1901.318 | 12.8 | 329.7 | 5.69 | VII | |
| .337 | 10.7 | 330.7 | 5.70 | VI | |
| .356 | 10.8 | 330.1 | 6.00 | VI | |
| .375 | 11.8 | 331.1 | 5.94 | III | Blazing. |
| .447 | 13.1 | 329.8 | 6.01 | VII | Good. |
| 1902.398 | 12.6 | 329.3 | 5.90 | V | |
| .480 | 14.9 | 328.7 | 5.86 | V | |
| .483 | 14.3 | 328.3 | 5.70 | V | Through clouds. Good. |

| Date. | Sid. T. | ρ | s | Eye-piece. | Remarks |
|-------|---------|--------|-----|------------|---------|
| | h | ° | ' | | |

 γ VIRGINIS—Continued.

| | | | | | |
|----------|------|--------|------|--------|-------------------|
| 1903.338 | 11.6 | 330.1 | 5.87 | III | Very poor seeing. |
| .368 | 11.3 | 329.1 | 5.82 | X | |
| .371 | 12.4 | 149.0 | 5.93 | X | |
| 1904.474 | 13.9 | 329.5 | 5.55 | X | |
| .483 | 14.1 | 329.7 | 5.75 | X | |
| .488 | 14.3 | 331.0 | 5.84 | X | |
| 1906.492 | 14.4 | 329.6 | 5.92 | VI | |
| .495 | 14.7 | 327.3 | 5.74 | VII | |
| .498 | 14.5 | 327.3 | 5.85 | VII | |
| 1897.474 | 3 n | 329.00 | 5.63 | Means. | |
| 1898.365 | 2 n | 331.15 | 5.92 | | |
| 1899.504 | 3 n | 328.63 | 5.82 | | |
| 1901.367 | 5 n | 330.98 | 5.87 | | |
| 1902.454 | 3 n | 328.77 | 5.82 | | |
| 1903.359 | 3 n | 329.40 | 5.87 | | |
| 1904.482 | 3 n | 330.07 | 5.71 | | |
| 1906.495 | 3 n | 328.07 | 5.84 | | |

 α 256

R. A., 12h 51m.3

Dec., $-0^{\circ} 25'$

| | | | | | |
|----------|------|-------|------------------|-----|--|
| 1902.297 | 11.9 | 256.9 | 0.57 | VII | |
| .398 | 12.8 | 74.0 | 0.59 | VII | |
| .486 | 15.0 | 71.1 | 0.60 <i>est.</i> | VI | |
| 1903.316 | 11.7 | 252.1 | 0.63 | VII | |
| .338 | 12.5 | 254.6 | 0.61 | VII | |
| .349 | 12.1 | 73.8 | 0.62 | VII | |
| 1906.492 | 14.7 | 76.3 | 0.61 | VII | |
| .498 | 14.9 | 253.1 | 0.64 | VII | |

6 OBS.

| Date. | Sid. T. | p | s | Eyepiece. | Remarks. |
|-------|---------|-----|-----|-----------|----------|
| | h | o | ' | | |

O Σ 256—Continued.

| | | | | | |
|----------|-----|-------|------|--------|--|
| 1902.394 | 3 n | 74.00 | 0.59 | Means. | |
| 1903.334 | 3 n | 73.50 | 0.62 | | |
| 1906.495 | 2 n | 74.70 | 0.62 | | |

Z 1728, 42 COMAE

R, A., 13h 5m.1

Dec., +18° 3'

| | | | | | |
|----------|------|-------|------------------|---------|--------------------------------|
| 1898.323 | .... | .... | .... | Suspect | very slight elongation in 10°. |
| .537 | .... | .... | .... | .... | Single. |
| 1899.312 | .... | .... | .... | Suspect | slight elongation in 0°. |
| .523 | 15.7 | 11.3 | 0.30 <i>est.</i> | VII | Elongated. |
| .537 | 15.3 | 18.6 | 0.30 <i>est.</i> | VII | Elongated. |
| .540 | 15.8 | 8.3 | 0.25 <i>est.</i> | VIII | Elongated. |
| 1901.318 | 13.2 | 8.7 | 0.54 | VII | Notched. |
| .323 | 11.7 | 10.6 | 0.37 | VII | Blurred. |
| .370 | 14.2 | 10.5 | 0.55 | VII | Separated by glimpses. |
| .395 | 13.3 | 12.8 | 0.40 | VII | Separated. |
| 1902.297 | 12.0 | 191.1 | 0.52 | VII | Blurred. Not separated. |
| .486 | 14.7 | 194.8 | 0.62 | VI | |
| .494 | 14.7 | 10.4 | 0.48 | VII | |
| 1903.316 | 11.9 | 192.5 | 0.57 | VII | |
| .338 | 11.7 | 188.6 | 0.62 | VII | |
| .349 | 12.2 | 190.2 | 0.59 | VII | |
| .368 | 11.5 | 193.8 | 0.64 | VIII | Separated. |
| 1906.492 | 15.0 | 193.7 | 0.64 | VII | |
| .508 | 14.8 | 196.6 | 0.68 | VII | |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece. | Remarks. |
|-------|----------|----------|----------|-----------|----------|
| | <i>h</i> | <i>o</i> | <i>r</i> | | |

42 COMAE—Continued.

| | | | | | |
|----------|------------|--------|------|--------|--|
| 1899.533 | 3 <i>n</i> | 192.73 | 0.28 | Means. | |
| 1901.352 | 4 <i>n</i> | 190.65 | 0.46 | | |
| 1902.392 | 3 <i>n</i> | 192.10 | 0.54 | | |
| 1903.343 | 3 <i>n</i> | 191.26 | 0.60 | | |

 β 800R. A., 13^h 11^m.9

Dec., +17° 34'

| | | | | | |
|----------|------|-------|------|----------------|----------------------------|
| 1897.334 | 13.3 | 114.6 | 2.49 | III | Good. |
| .441 | 14.0 | 115.1 | 2.45 | IV | Through clouds. |
| .463 | 14.6 | 115.8 | 2.55 | III | Very poor seeing. |
| 1898.323 | 11.5 | 113.3 | 2.66 | IV | |
| .408 | 14.1 | 112.6 | 2.78 | V ₁ | |
| .537 | 16.6 | 112.7 | 2.60 | IV | |
| 1899.436 | 13.7 | 112.0 | 2.76 | III | Blurred. |
| .523 | 16.0 | 113.5 | 2.63 | VII | Good. |
| .537 | 16.4 | 113.2 | 2.77 | VII | |
| 1901.318 | 13.5 | 111.3 | 2.43 | VII | |
| .323 | 12.0 | 108.0 | 2.73 | VII | |
| .337 | 11.0 | 110.8 | 2.90 | VI | |
| .356 | 11.1 | 112.8 | 2.85 | VI | Very bad seeing. |
| 1902.480 | 16.5 | 110.5 | 2.78 | V | |
| .483 | 14.9 | 111.8 | 2.82 | V | Through clouds. Difficult. |
| .486 | 14.8 | 113.7 | 2.89 | V | |
| 1903.316 | 12.1 | 110.0 | 2.98 | V | |
| .338 | 12.8 | 116.0 | 3.04 | X | |
| .349 | 12.4 | 111.4 | 2.92 | III | |
| 1906.498 | 15.1 | 113.9 | 3.10 | X | |
| .508 | 15.2 | 111.8 | 2.99 | V | |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece. | Remarks. |
|-------|---------|----------|----------|------------|----------|
| | h | o | ' | | |

 β 800—Continued.

| | | | | | |
|----------|------------|--------|------|--------|--|
| 1897.413 | 3 <i>n</i> | 115.17 | 2 50 | Means. | |
| 1898.423 | 3 <i>n</i> | 112.87 | 2.68 | | |
| 1899.499 | 3 <i>n</i> | 112.90 | 2.72 | | |
| 1901.334 | 4 <i>n</i> | 110.72 | 2.73 | | |
| 1902.483 | 3 <i>n</i> | 112.00 | 2.83 | | |
| 1903.334 | 3 <i>n</i> | 112.47 | 2.98 | | |

O Σ 266R. A., 13^h 23^m.6

Dec., +16° 14'

| | | | | | |
|----------|------------|--------|------|--------|-------|
| 1901.381 | 12.4 | 161.5 | 1.56 | III | |
| .395 | 13.7 | 342.1 | 1.75 | VII | |
| 1906.492 | 15.2 | 342.3 | 1.71 | VII | Good. |
| .495 | 15.2 | 346.3 | 1.42 | VII | Poor. |
| 1901.388 | 2 <i>n</i> | 341.80 | 1.65 | Means. | |
| 1906.494 | 2 <i>n</i> | 344.30 | 1.57 | | |

O Σ 269R. A., 13^h 28^m.3

Dec., +35° 25'

| | | | | | |
|----------|------|-------|------------------|------|-------------------------|
| 1897.515 | 15.7 | 214.6 | 0.25 <i>est.</i> | IV | Elongated. |
| 1898.537 | 16.7 | 38.7 | 0.25 <i>est.</i> | IV | Very slight elongation. |
| .608 | 17.8 | 54.8 | 0.25 <i>est.</i> | IV | Elongated. Blurred. |
| 1899.520 | 16.4 | 49.2 | 0.25 <i>est.</i> | VIII | Elongated. |
| .523 | 16.1 | 221.3 | 0.25 <i>est.</i> | VII | Elongated. |
| .537 | 16.6 | 46.4 | 0.25 <i>est.</i> | VII | Elongated. |
| 1901.447 | 15.3 | 44.7 | 0.30 <i>est.</i> | VII | Elongated. |
| .460 | 15.0 | 49.4 | 0.25 <i>est.</i> | VII | Elongated. |
| .494 | 15.3 | 44.4 | 0.30 <i>est.</i> | VIII | Elongated. |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece. | Remarks. |
|-------|----------|----------|----------|------------|----------|
| | <i>h</i> | <i>o</i> | <i>r</i> | | |

O Σ 269— Continued.

| | | | | | |
|----------|------------|-------|-------------------|--------|----------------------------|
| 1902.494 | 16.0 | 46.3 | 0.25 <i>est.</i> | VII | Elongated. |
| .508 | 15.4 | .... | .... | .... | Suspect elongation in 30° |
| .524 | 15.6 | 46.3 | 0.25 <i>est.</i> | VII | |
| .527 | 15.7 | 36.9 | 0.25 <i>est.</i> | VII | Elongated. |
| 1903.316 | 12.2 | 42.1 | 0.25 <i>est.</i> | VIII | Elongated. |
| .338 | 12.2 | 37.1 | 0.25 <i>est.</i> | VII | Elongated, |
| .349 | 12.7 | 220.7 | 0.201 <i>est.</i> | VIII | Wedge |
| 1906.508 | 15.3 | ..... | .... | VII | Suspect elongation in 200° |
| 1897.515 | 1 <i>n</i> | 34.60 | 0.25 | Means. | |
| 1898.572 | 2 <i>n</i> | 46.75 | 0.25 | | |
| 1899.527 | 3 <i>n</i> | 45.63 | 0.25 | | |
| 1901.467 | 3 <i>n</i> | 46.17 | 0.28 | | |
| 1902.515 | 3 <i>n</i> | 43.17 | 0.25 | | |
| 1903.334 | 3 <i>n</i> | 39.97 | 0.23 | | |

 Σ 1757

R. A., 13h 29m.2

Dec., +0° 12'

| | | | | | |
|----------|------------|-------|------|--------|-------|
| 1903.368 | 12.5 | 78.9 | 2.64 | VI | Good. |
| .371 | 12.6 | 77.8 | 2.33 | X | |
| .439 | 13.8 | 77.4 | 2.42 | III | Good. |
| 1906.498 | 15.2 | 80.2 | 2.47 | VI | |
| .508 | 15.5 | 80.5 | 2.38 | VI | |
| 1903.393 | 3 <i>n</i> | 78.03 | 2.46 | Means. | |
| 1006.503 | 2 <i>n</i> | 80.35 | 2.42 | | |

OBSERVATIONS OF DOUBLE STARS.

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece. | Remarks. |
|-------|----------|----------|----------|-----------|----------|
| | <i>h</i> | <i>o</i> | <i>u</i> | | |

Σ 1768, 25 CAN. VEN.

R. A., 13^h 33^m.0

Dec., +36° 48'

| | | | | | |
|----------|------|-------|------|------|---------------------|
| 1897.515 | 15.6 | 137.0 | 1.05 | IV | Good. |
| .545 | 16.1 | 136.7 | 1.08 | IV | Very blurred. |
| .644 | 18.9 | 135.3 | 1.12 | IV | Very blurred. |
| 1898.323 | 12.3 | 134.8 | 1.01 | IV | |
| .537 | 16.2 | 134.2 | 1.00 | IV | Good. |
| .553 | 16.5 | 133.5 | .... | IV | |
| .600 | 17.4 | 134.2 | 0.88 | IV | Very blurred. |
| 1899.520 | 16.6 | 135.5 | 1.16 | VII | |
| .523 | 16.2 | 133.4 | 1.11 | VII | |
| .537 | 15.9 | 133.8 | 1.08 | VII | Through clouds. |
| 1901.447 | 15.5 | 134.1 | 1.10 | VII | Very blurred. |
| .460 | 15.2 | 136.5 | 1.27 | VIII | Very blurred. |
| .465 | 16.7 | 135.4 | 1.22 | VII | Blurred. |
| .491 | 15.2 | 136.2 | .... | III | Very blurred. |
| 1902.490 | 16.7 | 133.5 | 1.05 | III | Blurred. Difficult. |
| .486 | 15.4 | 135.0 | 1.17 | VI | Very blurred. |
| .494 | 16.4 | 135.7 | 1.13 | VII | Good. |
| 1903.349 | 12.9 | 130.3 | 1.30 | VI | Blurred. |
| .368 | 11.7 | 128.4 | 1.35 | VI | Blurred. |
| .376 | 11.6 | 129.1 | 1.11 | VII | Blurred. |
| .390 | 11.7 | 127.2 | 1.19 | VII | |
| 1904.530 | 16.3 | 130.7 | 1.11 | VII | Good. |
| .535 | 16.3 | 133.0 | 0.86 | VI | |
| .560 | 16.6 | 132.8 | 0.95 | VI | Very blurred. |
| 1906.498 | 15.7 | 132.1 | 0.96 | VI | |
| .508 | 15.7 | 131.8 | 1.08 | VI | Poor seeing. |
| .510 | 15.4 | 130.1 | 1.22 | VII | |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece. | Remarks. |
|-------|----------|----------|----------|-----------|----------|
| | <i>h</i> | <i>o</i> | <i>r</i> | | |

25 CAN. VEN.—Continued.

| | | | | | |
|----------|------------|--------|------|--------|--|
| 1897.568 | 3 <i>n</i> | 136.33 | 1.08 | Means. | |
| 1898.487 | 3 <i>n</i> | 134.40 | 0.96 | | |
| 1899.527 | 3 <i>n</i> | 134.23 | 1.12 | | |
| 1901.457 | 3 <i>n</i> | 135.33 | 1.20 | | |
| 1902.487 | 3 <i>n</i> | 134.73 | 1.16 | | |
| 1903.371 | 4 <i>n</i> | 128.75 | 1.24 | | |
| 1904.542 | 3 <i>n</i> | 132.17 | 0.97 | | |
| 1906.506 | 3 <i>n</i> | 131.33 | 1.09 | | |

 β 612R. A., 13^h 34^m.7

Dec., +11° 15'

| | | | | | |
|----------|------|------------------|------------------|---------|-----------------------|
| 1897.515 | 16.0 | 42.2 | 0.25 <i>est.</i> | IV | Notched. |
| .545 | 15.9 | 226.1 | 0.25 <i>est.</i> | IV | Elongated. |
| 1898.323 | 11.6 | 227.8 | 0.35 <i>est.</i> | IV | Elongated. |
| 1899.523 | 16.4 | 55.5 | 0.25 <i>est.</i> | VII | Elongated. |
| .537 | 15.4 | 230.8 | 0.30 <i>est.</i> | VII | Elongated. |
| .542 | 16.0 | 229.0 | 0.30 <i>est.</i> | VIII | Elongated. |
| 1901.370 | 14.4 | 230. <i>est.</i> | .... | VII | Elongated. |
| .416 | 14.6 | 243.2 | 0.30 <i>est.</i> | VII | Elongated. Blurred. |
| .441 | 13.3 | 227.8 | 0.25 <i>est.</i> | VII | Wedge. |
| .447 | 13.6 | 240.0 | 0.30 <i>est.</i> | VII | Distinctly elongated. |
| 1902.503 | 15.4 | .... | .... | VII | Round. Good seeing. |
| .524 | 15.4 | 88.1 | 0.25 <i>est.</i> | VII | |
| .527 | 15.5 | 69.8 | 0.25 <i>est.</i> | VII | Elongated. |
| 1903.316 | 12.4 | .... | ... | .... | Cannot. |
| .439 | 14.0 | .... | .... | Suspect | elongation in 100° |
| 1904.530 | .... | .... | .... | .... | Cannot. |
| 1906.492 | 15.2 | .... | .... | .... | Cannot. |

| Date. | Sid. T. | p | s | Eyepiece. | Remarks. |
|-------|---------|-----|-----|-----------|----------|
| | h | o | " | | |

 β 612—Continued.

| | | | | | |
|----------|-----|--------|------|--------|--|
| 1897.530 | 2 n | 224.15 | 0.25 | Means. | |
| 1898.323 | 1 n | 227.80 | 0.35 | | |
| 1899.534 | 3 n | 231.77 | 0.28 | | |
| 1901.435 | 3 n | 236.67 | 0.28 | | |
| 1902.526 | 2 n | 258.95 | 0.25 | | |

 Σ 1777, 84 VIRGINIS

R. A., 13h 38m.0

Dec., +4° 3'

| | | | | | |
|----------|------|--------|------|-------|----------|
| 1901.375 | 12.8 | 232.3 | 3.20 | III | Blurred. |
| .381 | 12.0 | 231.5 | 3.13 | VII | |
| .414 | 13.4 | 231.6 | 3.18 | III | |
| 1901.390 | 3 n | 231.80 | 3.17 | Mean. | |

 Σ 1785

R. A., 13h 44m.5

Dec., +27° 29'

| | | | | | |
|----------|------|-------|------|-----|-------|
| 1897.444 | 14.0 | 266.5 | 1.34 | IV | Good. |
| .447 | 15.9 | 266.6 | 1.46 | IV | |
| .515 | 15.8 | 266.3 | 1.37 | IV | |
| 1898.323 | 12.7 | 271.5 | 1.23 | IV | |
| .482 | 15.1 | 271.7 | 1.37 | IV | Good. |
| .537 | 16.0 | 270.7 | 1.44 | IV | |
| 1899.436 | 14.5 | 274.6 | 1.36 | VII | |
| .520 | 15.9 | 275.3 | 1.57 | VII | |
| .523 | 16.8 | 274.5 | 1.63 | VII | Good. |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece. | Remarks. |
|-------|----------|----------|----------|-----------|----------|
| | <i>h</i> | <i>o</i> | <i>r</i> | | |

Σ 1785—Continued.

| | | | | | |
|----------|------------|--------|------|--------|--------------|
| 1901.337 | 11.2 | 285.6 | 1.12 | VI | |
| .416 | 14.3 | 282.5 | 1.37 | VII | Good. |
| .447 | 13.8 | 281.8 | 1.27 | VII | Fine seeing. |
| .447 | 15.7 | 280.1 | 1.46 | VII | Good seeing. |
| 1902.486 | 15.1 | 287.5 | 1.34 | VI | Good. |
| .494 | 16.6 | 286.2 | 1.38 | VII | |
| .508 | 15.6 | 286.3 | 1.42 | VII | Good. |
| 1903.349 | 13.2 | 290.8 | 1.51 | VI | |
| .368 | 12.0 | 292.7 | 1.49 | VI | Good. |
| .371 | 12.8 | 294.2 | 1.39 | III | |
| 1904.598 | 16.6 | 295.3 | 1.23 | VI | |
| 1906.492 | 15.3 | 304.4 | 1.37 | VII | |
| .498 | 15.6 | 304.0 | 1.24 | VI | |
| 1897.469 | 3 <i>n</i> | 266.47 | 1.39 | Means. | |
| 1898.447 | 3 <i>n</i> | 271.30 | 1.35 | | |
| 1899.493 | 3 <i>n</i> | 274.80 | 1.52 | | |
| 1901.412 | 4 <i>n</i> | 282.50 | 1.30 | | |
| 1902.496 | 3 <i>n</i> | 286.67 | 1.38 | | |
| 1903.363 | 3 <i>n</i> | 292.57 | 1.46 | | |
| 1904.598 | 1 <i>n</i> | 295.30 | 1.23 | | |
| 1906.495 | 2 <i>n</i> | 304.20 | 1.30 | | |

OΣ 278

R. A., 14^h 8^m.3

Dec., +44° 39'

| | | | | | |
|----------|------|-------|------------------|----|------------|
| 1897.630 | 17.9 | 92.2 | 0.30 <i>est.</i> | IV | Elongated. |
| .633 | 18.2 | 96.7 | 0.30 <i>est.</i> | IV | Notched. |
| .673 | 18.3 | 95.2 | 0.35 <i>est.</i> | IV | Elongated. |
| 1898.323 | 12.0 | 100.5 | 0.20 <i>est.</i> | IV | Elongated. |

7 OBS.

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece. | Remarks. |
|-------|----------|----------|----------|------------|----------|
| | <i>h</i> | <i>o</i> | <i>s</i> | | |

OZ 278—Continued.

| | | | | | |
|----------|------------|-------|------------------|--------|------------------------|
| 1898.537 | 16.9 | 93.0 | 0.35 <i>est.</i> | IV | Elongated. |
| .608 | 17.5 | 90.0 | 0.35 <i>est.</i> | IV | Elongated. |
| 1899.523 | 17.0 | 91.9 | 0.35 <i>est.</i> | VII | Elongated. |
| .537 | 16.7 | 86.0 | 0.25 <i>est.</i> | VII | Elongated. |
| .540 | 17.0 | 92.6 | 0.30 <i>est.</i> | VIII | Elongated. |
| 1901.447 | 15.9 | 87.8 | 0.30 <i>est.</i> | VII | Elongated. |
| .494 | 15.8 | 80.6 | 0.25 <i>est.</i> | VIII | Blurred and difficult. |
| 1902.524 | 16.2 | 88.4 | 0.30 <i>est.</i> | VII | Wedge. |
| .527 | 15.7 | 85.5 | 0.25 <i>est.</i> | VII | Notched. Good. |
| 1903.390 | 11.8 | 87.9 | 0.30 <i>est.</i> | VII | Elongated. |
| 1906.560 | 16.2 | 80.9 | 0.25 <i>est.</i> | VIII | Elongated. |
| .563 | 16.7 | 84.1 | 0.30 <i>est.</i> | VII | Notched, |
| 1897.645 | 3 <i>n</i> | 94.70 | 0.32 | Means. | |
| 1898.489 | 3 <i>n</i> | 94.50 | 0.30 | | |
| 1899.533 | 3 <i>n</i> | 90.17 | 0.30 | | |
| 1901.470 | 2 <i>n</i> | 84.20 | 0.28 | | |
| 1902.526 | 2 <i>n</i> | 86.95 | 0.28 | | |
| 1903.390 | 1 <i>n</i> | 87.90 | 0.30 | | |
| 1906.561 | 2 <i>n</i> | 82.50 | 0.28 | | |

Z 1819

R. A., 14^h 10^m.3

Dec., +3° 36'

| | | | | | |
|----------|------|-------|------|-----|---------------|
| 1901.381 | 12.9 | 357.0 | 1.02 | III | Very blurred. |
|----------|------|-------|------|-----|---------------|

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece. | Remarks. |
|-------|----------|----------|----------|------------|----------|
| | <i>h</i> | <i>o</i> | <i>r</i> | | |

‘ BOOTIS, A B.

R. A., 14^h 12^m.7

Dec., +51° 50′

| | | | | | |
|----------|------|------|------|------|---------|
| 1902.524 | 16.3 | .... | .... | .... | Single. |
| 1906.560 | 16.4 | .... | .... | .... | Cannot. |

Σ 1834

R. A., 14^h 16^m.6

Dec., +48° 58′

| | | | | | |
|----------|------|------|------|----------|---------------------|
| 1897.630 | 17.7 | .... | .... | IV | Single. |
| .633 | 18.3 | .... | .... | IV | Round. Single. |
| 1898.323 | 11.8 | .... | .... | IV | Single. |
| .608 | 17.6 | .... | .... | IV | Single. |
| 1899.523 | 17.2 | .... | .... | VII | Single. |
| .540 | 16.9 | .... | .... | Doubtful | elongation in 150°. |
| 1901.447 | 16.1 | .... | .... | VII | Single. |
| .494 | 16.0 | .... | .... | VIII | Single. |
| 1902.494 | 16.0 | .... | .... | VII | Single. |

Σ 1837

R. A., 14^h 19^m.2

Dec., -11° 13′

| | | | | | |
|----------|------------|--------|------|--------|---------------|
| 1902.582 | 16.7 | 301.7 | 1.08 | VI | Very blurred. |
| 1903.396 | 14.1 | 301.8 | 1.24 | VII | |
| .401 | 13.4 | 304.5 | 1.13 | VII | |
| 1906.498 | 15.4 | 302.2 | 1.13 | VI | |
| .510 | 15.2 | 303.2 | 1.14 | VII | |
| 1903.059 | 3 <i>n</i> | 302.67 | 1.15 | Means. | |
| 1906.504 | 2 <i>n</i> | 302.70 | 1.14 | | |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece. | Remarks. |
|-------|----------|----------|----------|-----------|----------|
| | <i>h</i> | <i>o</i> | <i>s</i> | | |

Σ 1865, ζ Bootis

R. A., 14^h 36^m.4

Dec., +14° 9'

| | | | | | |
|----------|------------|--------|------------------|--------|---------------------------|
| 1897.515 | 16.2 | .... | .... | IV | Round. Single. |
| .630 | 17.4 | .... | .... | IV | Single. |
| 1898.592 | 16.8 | .... | .... | IV | Single. |
| 1899.520 | 16.0 | .... | ... | VII | Single. |
| 1901.441 | 13.4 | 333.7 | 0.35 <i>est.</i> | VII | Distinctly elongated. |
| .447 | 14.0 | 325.0 | 0.30 <i>est.</i> | VII | Elongated. |
| .452 | 13.6 | 325.6 | 0.30 <i>est.</i> | VIII | Elongated. Blazing. |
| .460 | 14.0 | 333.3 | 0.30 <i>est.</i> | VIII | Blazing. |
| 1902.503 | 14.8 | 336.3 | 0.30 <i>est.</i> | VI | Elongated. |
| .524 | 15.2 | 332.0 | 0.42 | VII | Notched. |
| .535 | 15.7 | 330.4 | 0.35 <i>est.</i> | VII | Not separated. |
| 1903.349 | 13.3 | 325.7 | 0.30 <i>est.</i> | VIII | Elongated. |
| .368 | 13.0 | 330.2 | 0.30 <i>est.</i> | VII | Notched. |
| .376 | 11.7 | 322.4 | 0.47 | VII | Not separated. |
| .390 | 13.0 | 328.7 | 0.44 | VIII | Blurred. |
| 1904.530 | 15.9 | 327.1 | 0.40 | VII | Notched. |
| .593 | 16.5 | 328.6 | 0.47 | VIII | Separated. |
| .598 | 16.8 | 328.3 | 0.43 | VII | Notched. |
| 1906.492 | 15.5 | 324.8 | 0.53 | VII | Through thin clouds. |
| .510 | 14.2 | 328.8 | 0.44 | VII | Daylight obs. Good, |
| .513 | 14.4 | 329.2 | 0.41 | VIII | Daylight. Well separated. |
| 1901.450 | 4 <i>n</i> | 329.40 | 0.31 | Means. | |
| 1902.521 | 3 <i>n</i> | 332.90 | 0.36 | | |
| 1903.371 | 4 <i>n</i> | 326.62 | 0.38 | | |
| 1904.567 | 3 <i>n</i> | 328.00 | 0.43 | | |
| 1906.505 | 3 <i>n</i> | 327.60 | 0.46 | | |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece. | Remarks. |
|-------|----------|----------|----------|-----------|----------|
| | <i>h</i> | <i>o</i> | <i>r</i> | | |

1879

B. A., 14^h 41^m.4

Dec., +10° 5'

| | | | | | |
|----------|------|--------|------|--------|------------------------|
| 1897.447 | 15.7 | 141.9 | 0.48 | IV | |
| .515 | 16.3 | 144.6 | 0.53 | IV | Good. |
| 1899.520 | 16.2 | 145.6 | 0.57 | VII | Separated. |
| .523 | 16.6 | 140.1 | 0.60 | VII | Good. |
| .542 | 16.4 | 139.2 | 0.53 | VIII | |
| 1901.460 | 14.2 | 139.4 | 0.47 | VIII | |
| 1902.524 | 16.7 | 132.3 | 0.55 | VII | Good. |
| .535 | 15.9 | 131.2 | 0.51 | VII | |
| .582 | 16.9 | 132.2 | 0.56 | VII | |
| 1903.349 | 13.6 | 138.1 | 0.46 | VIII | Separated by glimpses. |
| .368 | 12.9 | 134.2 | 0.46 | VII | Just separated, |
| .390 | 12.8 | 130.3 | 0.61 | VIII | Through clouds. |
| 1904.598 | 17.1 | 130.9 | 0.50 | VII | |
| 1906.492 | 15.6 | 133.3 | 0.48 | VII | |
| .510 | 15.6 | 130.1 | 0.63 | VII | |
| 1897.481 | 2 n | 143.25 | 0.50 | Means. | |
| 1899.528 | 3 n | 141.63 | 0.57 | | |
| 1901.460 | 1 n | 139.40 | 0.47 | | |
| 1902.547 | 3 n | 131.90 | 0.54 | | |
| 1903.369 | 3 n | 134.20 | 0.51 | | |
| 1904.598 | 1 n | 130.90 | 0.50 | | |
| 1906.501 | 2 n | 131.70 | 0.56 | | |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece. | Remarks. |
|-------|----------|----------|----------|-----------|----------|
| | <i>h</i> | <i>o</i> | <i>r</i> | | |

OZ 285

R. A., 14^h 41^m.7

Dec., +42° 48'

| | | | | | |
|----------|------------|--------|------------------|--------|-----------------------|
| 1897.630 | 17.5 | 317.0 | 0.35 <i>est.</i> | IV | Notched. |
| .633 | 18.5 | 319.5 | 0.30 <i>est.</i> | IV | Notched. |
| .647 | 18.4 | 306.3 | 0.30 <i>est.</i> | IV | Elongated. Blurred. |
| 1898.323 | 12.2 | 317.3 | 0.25 <i>est.</i> | IV | Elongated. |
| .537 | 17.1 | 316.2 | 0.30 <i>est.</i> | IV | Elongated. |
| .562 | 17.4 | 317.5 | 0.25 <i>est.</i> | IV | Elongated. |
| 1899.523 | 17.5 | 309.6 | 0.30 <i>est.</i> | VII | Elongated. |
| .537 | 16.9 | 316.4 | 0.30 <i>est.</i> | VII | Elongated. |
| .573 | 17.3 | 308.5 | 0.30 <i>est.</i> | VIII | Wedge shaped. |
| 1901.494 | 16.7 | 317.8 | 0.35 <i>est.</i> | VIII | Elongated. Difficult. |
| 1902.524 | 16.5 | 302.1 | 0.30 <i>est.</i> | VII | Elongated. |
| .527 | 15.9 | 299.7 | 0.25 <i>est.</i> | VII | Wedge. |
| .574 | 17.0 | 305.8 | 0.35 <i>est.</i> | VII | Not separated. |
| 1903.376 | 11.9 | 301.3 | 0.30 <i>est.</i> | VII | Elongated. |
| .390 | 12.1 | 297.7 | 0.30 <i>est.</i> | VIII | Elongated. |
| 1906.562 | 16.9 | 293.0 | 0.42 | VIII | |
| .611 | 17.3 | 296.0 | 0.37 | VIII | Barely separated. |
| 1897.637 | 3 <i>n</i> | 314.27 | 0.32 | Means. | |
| 1898.474 | 3 <i>n</i> | 317.00 | 0.27 | | |
| 1899.544 | 3 <i>n</i> | 311.50 | 0.30 | | |
| 1901.494 | 1 <i>n</i> | 317.80 | 0.35 | | |
| 1902.542 | 3 <i>n</i> | 302.53 | 0.30 | | |
| 1903.384 | 2 <i>n</i> | 299.50 | 0.30 | | |
| 1906.586 | 2 <i>n</i> | 294.50 | 0.40 | | |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece. | Remarks. |
|---|----------|----------|---------------|-----------|-------------------|
| | <i>h</i> | <i>o</i> | <i>'</i> | | |
| Σ 1883 | | | | | |
| R. A., 14 ^h 43 ^m .9 | | | Dec., +6° 23' | | |
| 1903.368 | 13.2 | 240.0- | 0.43 | VII | Separated. |
| .390 | 13.2 | 65.9 | 0.45 | VII | Barely separated. |
| .396 | 13.5 | 241.6 | 0.50 | VII | Separated. |
| 1906.510 | 15.8 | 239.3 | 0.65 | VII | |
| .513 | 15.2 | 239.0 | 0.48 | VIII | |
| 1903.385 | 3 " | 242.50 | 0.46 | Means. | |
| 1906.512 | 2 " | 239.15 | 0.56 | | |

 Σ 1888, ϵ BOOTISR. A., 14^h 46^m.8

Dec., +19° 31'

| | | | | | |
|----------|------|-------|------|------|---------------|
| 1897.447 | 15.2 | 216.5 | 2.98 | III | Good. |
| .545 | 17.2 | 216.0 | 2.83 | V | Blurred. |
| 1898.482 | 15.6 | 212.7 | 2.76 | IV | |
| .562 | 16.0 | 211.6 | 2.80 | IV | |
| .581 | 16.7 | 213.4 | 2.77 | IV | Very blurred. |
| 1899.537 | 17.1 | 208.5 | 2.91 | VII | Very blurred. |
| .540 | 17.6 | 210.9 | 2.69 | VIII | |
| .548 | 15.6 | 206.5 | 2.70 | III | |
| 1901.375 | 13.2 | 193.2 | 2.75 | III | Blurred. |
| .381 | 14.2 | 195.4 | 2.71 | III | Blurred. |
| .433 | 14.7 | 197.4 | 2.73 | III | Blurred. |
| .441 | 13.7 | 198.2 | 2.69 | VII | Good. |
| .494 | 16.2 | 196.2 | 2.73 | VIII | Blurred. |
| 1902.486 | 15.6 | 192.0 | 2.76 | VI | |
| .503 | 15.2 | 190.8 | 2.53 | VI | Good. |
| .508 | 15.8 | 194.6 | 2.53 | VII | |
| .535 | 16.4 | 191.3 | 2.69 | VI | Good. |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece. | Remarks. |
|-------|----------|----------|----------|------------|----------|
| | <i>h</i> | <i>o</i> | <i>s</i> | | |

ξ Bootis—Continued.

| | | | | | |
|----------|------|--------|------|--------|-------|
| 1903.371 | 13.0 | 185.1 | 2.89 | III | |
| .396 | 13.7 | 184.3 | 2.57 | VII | Good. |
| .401 | 13.6 | 186.7 | 2.62 | III | Good. |
| .453 | 14.0 | 186.3 | 2.58 | VI | Good. |
| 1904.530 | 15.9 | 180.4 | 2.43 | III | |
| .574 | 16.7 | 181.4 | 2.66 | VI | |
| .598 | 17.2 | 181.5 | 2.54 | VII | |
| 1906.492 | 16.2 | 171.1 | 2.54 | VII | |
| .508 | 15.9 | 173.3 | 2.68 | VI | |
| .510 | 15.9 | 171.4 | 2.47 | VII | |
| 1897.496 | 2 n | 216.25 | 2.90 | Means. | |
| 1898.542 | 3 n | 212.57 | 2.78 | | |
| 1899.542 | 3 n | 208.63 | 2.77 | | |
| 1901.425 | 5 n | 196.08 | 2.72 | | |
| 1902.508 | 4 n | 192.18 | 2.63 | | |
| 1903.405 | 4 n | 185.60 | 2.66 | | |
| 1904.567 | 3 n | 181.10 | 2.54 | | |
| 1906.503 | 3 n | 171.93 | 2.56 | | |

OΞ 288

R. A., 14h 48m.7

Dec., +16° 7'

| | | | | | |
|----------|------|-------|------|-----|----------|
| 1902.486 | 15.8 | 189.5 | 1.63 | VI | |
| .508 | 16.1 | 191.5 | 1.33 | VI | Blurred. |
| .535 | 16.0 | 190.8 | 1.71 | VII | Good. |
| 1903.371 | 13.2 | 186.3 | 1.58 | III | |
| .396 | 13.9 | 188.5 | 1.60 | VII | |
| .401 | 13.7 | 187.6 | 1.50 | III | |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece. | Remarks. |
|-------|---------|----------|----------|------------|----------|
| | h | o | ' | | |

O Σ 288— Continued.

| | | | | | |
|----------|------|--------|------|--------|--|
| 1904.574 | 16.8 | 190.6 | 1.54 | VI | |
| .593 | 16.8 | 190.5 | 1.75 | VII | |
| .598 | 17.4 | 190.8 | 1.70 | VII | |
| 1906.508 | 16.1 | 191.1 | 1.76 | VI | |
| .510 | 16.1 | 191.6 | 1.77 | VII | |
| .513 | 15.4 | 189.2 | 1.54 | VI | |
| 1902.510 | 3 n | 190.60 | 1.55 | Means. | |
| 1903.389 | 3 n | 187.47 | 1.56 | | |
| 1904.588 | 3 n | 190.63 | 1.66 | | |
| 1906.510 | 3 n | 190.63 | 1.69 | | |

 Σ 1932

R. A., 15h 14m.1

Dec., +27° 12'

| | | | | | |
|----------|------|-------|------|------|-------|
| 1897.367 | 14.3 | 325.2 | 0.78 | IV | Good. |
| .447 | 15.5 | 327.1 | 0.76 | IV | |
| .545 | 17.3 | 324.7 | 0.85 | IV | |
| 1898.492 | 15.8 | 327.6 | 0.61 | IV | Good. |
| .553 | 17.3 | 326.3 | 0.74 | IV | |
| .562 | 16.2 | 325.9 | 0.63 | IV | |
| 1899.520 | 17.7 | 328.9 | 0.67 | VII | |
| .523 | 18.2 | 327.5 | 0.66 | VII | |
| .540 | 17.7 | 328.8 | 0.73 | VIII | |
| 1901.441 | 14.5 | 330.9 | 0.73 | III | |
| .460 | 15.7 | 336.8 | 0.72 | VII | |
| .465 | 16.9 | 152.8 | 0.64 | VII | |
| 1902.508 | 17.0 | 335.7 | 0.64 | VII | |
| .524 | 16.9 | 333.1 | 0.64 | VII | |

8 Obs.

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece. | Remarks. |
|-------|----------|----------|----------|-----------|----------|
| | <i>h</i> | <i>o</i> | <i>r</i> | | |

Σ 1932—Continued.

| | | | | | |
|----------|------------|--------|------|--------|-------|
| 1902.527 | 15.3 | 337.8 | 0.71 | VII | Good. |
| 1903.368 | 13.3 | 337.9 | 0.62 | VII | |
| .390 | 13.3 | 154.7 | 0.66 | VII | |
| .396 | 13.3 | 152.9 | 0.66 | VII | |
| 1904.574 | 17.0 | 337.6 | 0.62 | VI | |
| .593 | 16.9 | 339.6 | 0.56 | VII | |
| .598 | 17.6 | 337.2 | 0.58 | VII | |
| 1906.492 | 16.0 | 346.8 | 0.68 | VII | |
| .508 | 16.3 | 164.4 | 0.79 | VII | |
| .510 | 15.0 | 344.6 | 0.80 | VII | |
| 1897.420 | 3 <i>n</i> | 325.67 | 0.80 | Means. | |
| 1898.532 | 3 <i>n</i> | 326.60 | 0.66 | | |
| 1899.528 | 3 <i>n</i> | 328.40 | 0.69 | | |
| 1901.455 | 3 <i>n</i> | 333.50 | 0.70 | | |
| 1902.520 | 3 <i>n</i> | 335.53 | 0.66 | | |
| 1903.385 | 3 <i>n</i> | 335.17 | 0.65 | | |
| 1904.588 | 3 <i>n</i> | 338.13 | 0.59 | | |
| 1906.503 | 3 <i>n</i> | 345.27 | 0.76 | | |

Σ 1937, η CORONAE BOREALIS

R. A., 15^h 19^m.1

Dec., +30° 39'

| | | | | | |
|----------|------|-------|------------------|-----|-------------------------|
| 1897.367 | 14.5 | 329.4 | 0.35 <i>est.</i> | IV | Blurred. Not separated. |
| .515 | 16.5 | 331.6 | 0.48 | IV | Good. |
| .630 | 18.3 | 333.5 | 0.56 | IV | |
| 1898.537 | 17.4 | 344.4 | 0.54 | IV | |
| .553 | 17.5 | 349.9 | 0.55 | IV | |
| .592 | 17.0 | 343.4 | 0.56 | IV | Blurred. |
| 1899.520 | 17.5 | 357.3 | 0.75 | VII | |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece. | Remarks. |
|-------------------------------|---------|----------|----------|-----------|---------------------|
| | h | o | " | | |
| γ CORONAE BOREALIS—Continued. | | | | | |
| 1899.523 | 18.1 | 352.1 | 0.64 | VII | |
| .540 | 17.8 | 352.0 | 0.67 | VIII | Good. |
| 1901.375 | 13.4 | 12.0 | 0.84 | VI | Blurred. |
| .441 | 14.8 | 5.1 | 0.86 | VI | |
| .452 | 13.7 | 8.0 | 0.69 | VII | |
| .460 | 15.9 | 10.2 | 0.81 | VII | |
| 1902.508 | 16.8 | 9.8 | 0.80 | VII | |
| .535 | 16.6 | 13.7 | 0.91 | VII | |
| .574 | 16.5 | 12.3 | 0.77 | VII | Good. |
| 1903.368 | 13.5 | 13.5 | 0.99 | VII | |
| .390 | 12.2 | 16.0 | 0.87 | VIII | |
| .396 | 14.6 | 14.4 | 1.01 | VII | |
| 1904.530 | 16.0 | 19.8 | 0.95 | VII | |
| .574 | 17.2 | 21.1 | 0.82 | VII | |
| .593 | 17.0 | 22.1 | 1.11 | VII | |
| 1906.492 | 16.4 | 26.2 | 1.12 | VII | |
| .510 | 14.6 | 25.4 | 0.96 | VII | Daylight obs. Good. |
| .513 | 15.0 | 25.3 | 1.06 | VIII | Daylight. |
| 1897.504 | 3 n | 331.50 | 0.46 | Means. | |
| 1898.561 | 3 n | 345.90 | 0.55 | | |
| 1899.528 | 3 n | 353.80 | 0.69 | | |
| 1901.432 | 4 n | 8.82 | 0.80 | | |
| 1902.539 | 3 n | 11.93 | 0.83 | | |
| 1903.385 | 3 n | 14.63 | 0.96 | | |
| 1904.566 | 3 n | 21.00 | 0.96 | | |
| 1906.505 | 3 n | 25.63 | 1.05 | | |

OBSERVATIONS OF DOUBLE STARS.

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece. | Remarks. |
|-------|---------|----------|----------|-----------|----------|
| | h | o | ' | | |

 μ^2 BOOTISR. A., 15^h 20^m.7

Dec., +37° 44'

| | | | | | |
|----------|------|------|------|------|----------|
| 1897.630 | 18.2 | 78.0 | 0.81 | IV | |
| .633 | 18.7 | 77.6 | 0.83 | IV | |
| .647 | 18.1 | 79.4 | 0.77 | IV | |
| 1898.537 | 17.6 | 76.6 | 0.75 | IV | |
| .553 | 17.6 | 76.9 | 0.76 | IV | |
| .592 | 17.2 | 77.5 | 0.67 | IV | |
| 1899.523 | 17.8 | 75.8 | 0.97 | VII | |
| .537 | 17.6 | 75.2 | 0.80 | VII | |
| .540 | 18.0 | 75.1 | 0.88 | VIII | |
| 1901.465 | 13.9 | 75.3 | 0.95 | VII | Good. |
| .471 | 14.5 | 76.4 | 0.92 | VIII | Good. |
| .477 | 14.4 | 74.5 | 0.83 | VII | Blurred. |
| 1902.524 | 17.1 | 70.2 | 0.84 | VII | Good. |
| .535 | 16.9 | 73.0 | 0.86 | VI | |
| .574 | 16.7 | 72.8 | 0.71 | VII | Good. |
| 1903.368 | 13.6 | 70.6 | 1.08 | VII | |
| .371 | 13.6 | 69.6 | 1.10 | III | |
| .390 | 12.4 | 72.5 | 0.96 | VIII | |
| 1904.530 | 16.9 | 66.9 | 0.87 | VII | |
| .593 | 17.2 | 67.2 | 0.93 | VII | |
| 1906.510 | 16.6 | 65.9 | 1.05 | VII | |
| .513 | 14.9 | 65.1 | 0.99 | VIII | |
| .560 | 16.7 | 62.9 | 0.99 | VI | |

| Date. | Sid. T. | p | s | Eyepiece. | Remarks. |
|-------|---------|-----|-----|-----------|----------|
| | h | o | . | | |

 μ^2 BOOTIS—Continued.

| | | | | | |
|----------|-----|-------|------|-------|--|
| 1897.637 | 3 n | 78.33 | 0.80 | Means | |
| 1898.561 | 3 n | 77.00 | 0.73 | | |
| 1899.533 | 3 n | 75.37 | 0.88 | | |
| 1901.471 | 3 n | 75.40 | 0.90 | | |
| 1902.544 | 3 n | 72.00 | 0.80 | | |
| 1903.376 | 3 n | 70.90 | 1.05 | | |
| 1904.562 | 2 n | 67.05 | 0.90 | | |
| 1906.528 | 3 n | 64.63 | 1.01 | | |

O Σ 298R. A., 15^h 32^m.5

Dec., +40° 8'

| | | | | | |
|----------|------|-------|------------------|------|----------|
| 1897.630 | 18.6 | 175.6 | 0.95 | IV | Blurred. |
| .633 | 18.9 | 177.0 | 1.09 | IV | |
| .647 | 18.3 | 176.4 | 1.02 | IV | |
| 1898.553 | 17.8 | 176.9 | 0.98 | IV | |
| .589 | 18.5 | 177.1 | 0.99 | IV | |
| .592 | 17.3 | 177.2 | 0.90 <i>est.</i> | IV | Clouds. |
| 1899.523 | 17.7 | 178.9 | 1.19 | VII | |
| .537 | 17.4 | 178.7 | 1.15 | VII | Good. |
| .540 | 18.2 | 182.1 | 0.99 | VIII | Good. |
| 1901.465 | 14.1 | 181.5 | 1.17 | VII | |
| .471 | 14.3 | 182.5 | 1.12 | VIII | |
| .477 | 14.6 | 182.6 | 1.09 | VII | |
| 1902.524 | 17.2 | 181.7 | 1.16 | VII | |
| .535 | 17.1 | 181.9 | 0.99 | VI | |
| .574 | 16.8 | 182.8 | 1.13 | VII | Good. |

OBSERVATIONS OF DOUBLE STARS.

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece. | Remarks. |
|-------|---------|----------|----------|-----------|----------|
| | h | ° | ' | | |

OS 298—Continued.

| | | | | | |
|----------|------|--------|------|--------|-----------------|
| 1903.371 | 13.4 | 182.7 | 1.22 | III | Through clouds. |
| .376 | 12.1 | 183.9 | 1.15 | VII | |
| .390 | 12.6 | 184.6 | 1.15 | VIII | |
| 1904.593 | 17.3 | 185.2 | 1.13 | VII | Fine seeing. |
| .598 | 17.7 | 183.7 | 1.20 | VII | |
| 1906.560 | 16.8 | 188.0 | 1.29 | VI | Good. |
| .562 | 17.0 | 186.2 | 1.22 | VII | |
| .611 | 17.1 | 186.1 | 1.05 | VI | Good. |
| 1897.637 | 3 n | 176.33 | 1.02 | Means. | |
| 1898.578 | 3 n | 177.07 | 0.98 | | |
| 1899.533 | 3 n | 179.90 | 1.11 | | |
| 1901.471 | 3 n | 182.20 | 1.13 | | |
| 1902.544 | 3 n | 182.13 | 1.09 | | |
| 1903.379 | 3 n | 183.73 | 1.17 | | |
| 1904.596 | 2 n | 184.45 | 1.16 | | |
| 1906.578 | 3 n | 186.77 | 1.19 | | |

 γ CORONAE BOREALIS

R. A., 15h 38m.5

Dec., +26° 37'

| | | | | | |
|----------|------|-------|------------------|-----|---------------|
| 1897.515 | 16.6 | 119.8 | 0.61 | IV | Very blurred. |
| .647 | 18.7 | 121.0 | 0.58 | IV | |
| .652 | 18.1 | 120.5 | 0.54 | IV | |
| 1898.537 | 17.8 | 123.2 | 0.50 <i>est.</i> | IV | Blurred. |
| .553 | 18.2 | 119.6 | 0.52 | IV | |
| .589 | 18.2 | 118.7 | 0.58 | IV | Blurred. |
| 1899.520 | 17.9 | 119.8 | 0.67 | VII | |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece. | Remarks. |
|-------|----------|----------|----------|-----------|----------|
| | <i>h</i> | <i>o</i> | <i>r</i> | | |

 γ CORONAE BOREALIS—Continued.

| | | | | | |
|----------|------------|--------|------|--------|---------------------|
| 1899.523 | 18.3 | 120.1 | 0.67 | VII | Distance very poor. |
| .540 | 18.5 | 121.0 | 0.67 | VIII | |
| 1901.452 | 14.0 | 121.9 | 0.55 | VIII | Very blurred. |
| .465 | 14.3 | 121.6 | 0.63 | VII | Good. |
| .469 | 14.2 | 120.3 | 0.50 | VIII | Blurred. |
| .472 | 14.7 | 119.4 | 0.72 | VIII | |
| 1902.508 | 17.2 | 116.0 | 0.66 | VII | Very blurred. |
| .524 | 17.5 | 114.7 | 0.60 | VII | |
| .527 | 15.2 | 117.6 | 0.63 | VII | |
| 1903.368 | 13.9 | 119.9 | 0.74 | VII | Blurred. |
| .376 | 12.4 | 113.5 | 0.70 | VII | Very faint. |
| .417 | 12.3 | 117.1 | 0.79 | VII | |
| 1904.530 | 16.7 | 114.9 | 0.67 | VII | Good. |
| .574 | 17.4 | 116.2 | 0.67 | VII | Blurred |
| .593 | 17.5 | 116.7 | 0.65 | VII | Blurred. |
| 1906.492 | 15.8 | 113.9 | 0.69 | VII | |
| .510 | 14.4 | 120.3 | 0.56 | VII | Daylight obs. Good. |
| .513 | 14.7 | 119.4 | 0.74 | VIII | Daylight. |
| 1897.605 | 3 <i>n</i> | 120.43 | 0.58 | Means. | |
| 1898.560 | 3 <i>n</i> | 120.50 | 0.53 | | |
| 1899.528 | 3 <i>n</i> | 120.30 | 0.67 | | |
| 1901.465 | 4 <i>n</i> | 120.80 | 0.60 | | |
| 1902.520 | 3 <i>n</i> | 116.10 | 0.63 | | |
| 1903.387 | 3 <i>n</i> | 116.83 | 0.74 | | |
| 1904.566 | 3 <i>n</i> | 115.93 | 0.66 | | |
| 1906.505 | 3 <i>n</i> | 117.87 | 0.66 | | |

| Date. | Sid. T. | p | s | Eyepiece. | Remarks. |
|-------|---------|-----|-----|-----------|----------|
| | h | o | . | | |

 Σ 1989, π^2 URSAE MAJORIS

R. A., 15h 45m.1

Dec., +80° 18'

| | | | | | |
|----------|------|-------|------------------|------|------------|
| 1897.660 | 20.1 | 343.8 | 0.25 <i>est.</i> | IV | Elongated. |
| 1899.540 | 16.8 | ..... | .... | VIII | Single. |
| 1901.477 | 15.1 | ..... | .... | VIII | Single. |
| 1902.524 | 17.4 | ..... | .... | VII | Single. |

 $O\Sigma$ 303

R. A., 15h 56m.2

Dec., +13° 33'

| | | | | | |
|----------|------|--------|------|--------|----------|
| 1902.508 | 17.5 | 152.1 | 0.68 | VII | Blurred. |
| .527 | 16.2 | 147.7 | 0.76 | VII | |
| .582 | 17.1 | 146.4 | 0.80 | VII | |
| 1903.368 | 14.1 | 146.1 | 0.86 | VII | |
| .396 | 14.7 | 145.0 | 0.71 | VII | |
| .401 | 13.9 | 143.4 | 0.66 | VII | |
| 1904.593 | 17.6 | 147.0 | 0.70 | VII | |
| .598 | 17.9 | 145.2 | 0.72 | VII | |
| .617 | 17.8 | 145.0 | 0.73 | VI | |
| 1906.492 | 16.6 | 146.6 | 0.74 | VII | |
| .510 | 16.3 | 151.0 | 0.75 | VII | |
| 1902.539 | 3 n | 148.73 | 0.75 | Means. | |
| 1903.388 | 3 n | 144.83 | 0.74 | | |
| 1904.602 | 2 n | 145.73 | 0.72 | | |
| 1906.501 | 2 n | 148.80 | 0.74 | | |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece. | Remarks |
|-------|----------|----------|----------|-----------|---------|
| | <i>h</i> | <i>o</i> | <i>s</i> | | |

ξ LIBRÆ, A B.

R. A. 15^h 58^m.9

Dec., -11° 6'

| | | | | | |
|----------|------------|--------|------------------|--------|---------------------------|
| 1897.633 | 17.6 | 220.4 | 0.63 | IV | |
| .636 | 17.5 | 220.7 | 0.68 | IV | |
| 1898.562 | 16.5 | 222.6 | 0.54 | IV | Blurred. |
| .589 | 16.9 | 222.3 | 0.54 | IV | |
| .600 | 16.9 | 224.5 | 0.57 | IV | Blurred. |
| 1899.542 | 15.7 | 228.4 | 0.56 | VIII | |
| .573 | 16.6 | 230.0 | 0.60 | VII | |
| .578 | 16.6 | 225.2 | 0.65 | VII | Blurred. |
| 1901.441 | 16.1 | 237.4 | 0.57 | VII | Blurred. |
| .465 | 16.0 | 241.1 | 0.44 | VIII | Blurred. |
| .477 | 15.5 | 237.2 | 0.54 | VIII | Unsteady. |
| 1902.574 | 17.2 | 69.2 | 9.40 <i>est</i> | VII | Notched. |
| .582 | 16.4 | 71.2 | 0.41 | VII | Notched. |
| .601 | 16.7 | 253.6 | 0.45 <i>est.</i> | VII | Notched. |
| 1903.543 | 16.4 | 90.0 | 0.30 <i>est.</i> | VII | Elongated. |
| .552 | 16.3 | 92.3 | 0.25 <i>est.</i> | VII | Elongated. |
| .557 | 16.2 | 268.0 | 0.35 <i>est.</i> | VII | Wedge. |
| 1904.530 | 16.5 | ..... | .... | VII | Cannot. |
| .593 | 17.7 | ..... | .... | VII | Cannot. |
| 1906.492 | 16.5 | ..... | .... | VII | Cannot. |
| .510 | 16.4 | ..... | .... | VII | Suspect elongation in 60° |
| 1897.634 | 2 <i>n</i> | 220.55 | 0.66 | Means. | |
| 1898.584 | 3 <i>n</i> | 223.13 | 0.55 | | |
| 1899.554 | 3 <i>n</i> | 227.87 | 0.60 | | |
| 1901.461 | 3 <i>n</i> | 238.57 | 0.52 | | |
| 1902.586 | 3 <i>n</i> | 251.33 | 0.42 | | |
| 1903.551 | 3 <i>n</i> | 270.10 | 0.30 | | |

9 OBS.

| Date. | Sid. T. | p | s | Eyepiece. | Remarks. |
|-------|---------|-----|-----|-----------|----------|
| | h | o | $.$ | | |

ξ LIBRAE, $\frac{1}{2}(A+B)$, C

R. A., 15^h 58^m.9

Dec., -11° 6'

| | | | | | |
|----------|------|-------|------|--------|---------------------|
| 1897.633 | 17.7 | 64.8 | 6.99 | IV | A C |
| .636 | 17.5 | 65.7 | 6.99 | IV | A C |
| 1898.562 | 16.7 | 65.0 | 6.83 | IV | A C |
| .589 | 17.1 | 64.9 | 6.88 | IV | A C |
| .600 | 17.1 | 63.0 | 7.29 | IV | |
| 1899.542 | 15.8 | 64.2 | 7.21 | VIII | |
| .548 | 15.9 | 63.7 | 7.21 | III | |
| .573 | 16.3 | 63.7 | 7.22 | III | |
| 1901.441 | 16.2 | 62.5 | 7.21 | VII | |
| .465 | 16.1 | 62.3 | 7.51 | VIII | Blurred. |
| 1902.535 | 17.4 | 60.6 | 7.08 | VI | A poor observation. |
| .574 | 17.3 | 61.7 | 7.29 | VII | |
| .582 | 16.3 | 61.3 | 7.20 | X | |
| .601 | 16.5 | 62.1 | 7.36 | X | |
| 1903.527 | 15.7 | 61.5 | 7.30 | VI | |
| .530 | 15.6 | 61.1 | 7.09 | X | |
| .543 | 16.3 | 62.8 | 7.39 | VI | |
| 1897.634 | 2 " | 64.17 | 7.29 | Means. | |
| 1898.584 | 4 " | 64.13 | 7.17 | | |
| 1899.554 | 3 " | 63.87 | 7.21 | | |
| 1901.453 | 2 " | 62.40 | 7.36 | | |
| 1902.573 | 4 " | 61.42 | 7.23 | | |
| 1903.533 | 3 " | 61.80 | 7.26 | | |

The reduction from A C to $\frac{1}{2}(A+B)$, C is included in the means.

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece. | Remarks. |
|-------|----------|----------|----------|------------|----------|
| | <i>h</i> | <i>o</i> | <i>r</i> | | |

Σ 2034

R. A., 16^h 1^m.0

Dec., +83° 55'

| | | | | | |
|----------|------------|--------|------|--------|--|
| 1897.722 | 20.8 | 114.1 | 1.35 | IV | Very blurred. Difficult. Very blurred. Good. |
| 1903.371 | 13.9 | 114.2 | 1.00 | VI | |
| .401 | 14.8 | 114.4 | 1.22 | VII | |
| .445 | 13.6 | 113.1 | 1.19 | VII | |
| 1904.617 | 18.3 | 116.3 | 1.09 | VI | |
| 1897.722 | 1 <i>n</i> | 114.10 | 1.35 | Means. | |
| 1903.406 | 3 <i>n</i> | 113.90 | 1.14 | | |
| 1904.617 | 1 <i>n</i> | 116.30 | 1.09 | | |

Σ 2021, 49 SERPENTIS, A B.

R. A., 16^h 8^m.6

Dec., +13° 48'

| | | | | | |
|----------|------------|--------|------|--------|--|
| 1902.574 | 18.2 | 333.7 | 3.73 | X | |
| .637 | 17.9 | 334.1 | 3.74 | X | |
| .642 | 19.6 | 333.5 | 3.79 | VI | |
| .679 | 20.5 | 330.5 | 3.54 | V | |
| 1903.371 | 14.3 | 155.3 | 4.06 | X | |
| .401 | 14.1 | 334.3 | 4.11 | III | |
| .439 | 14.2 | 335.1 | 3.97 | III | |
| 1906.508 | 16.5 | 336.1 | 4.07 | VII | |
| .611 | 17.5 | 336.8 | 3.85 | V | |
| 1902.633 | 4 <i>n</i> | 332.95 | 3.70 | Means. | |
| 1903.404 | 3 <i>n</i> | 334.90 | 4.05 | | |
| 1906.560 | 2 <i>n</i> | 336.45 | 3.96 | | |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece. | Remarks. |
|-------|----------|----------|----------|------------|----------|
| | <i>h</i> | <i>o</i> | <i>r</i> | | |

σ CORONAE

R. A., 16^h 10^m.9 Dec., +34° 7'

| | | | | | |
|----------|------------|--------|------|--------|-------|
| 1901.433 | 15.0 | 212.5 | 4.30 | III | Good. |
| .472 | 15.3 | 212.6 | 4.41 | VIII | |
| .483 | 14.7 | 211.5 | 4.26 | III | |
| 1902.593 | 19.0 | 214.2 | 4.66 | X | |
| .637 | 17.2 | 216.2 | 4.55 | X | |
| 1967 | 20.0 | 213.7 | 4.04 | V | |
| 1903.371 | 14.2 | 211.6 | 4.69 | X | |
| .401 | 14.3 | 211.9 | 4.61 | III | |
| .417 | 12.6 | 212.0 | 4.62 | VII | |
| 1904.617 | 17.6 | 214.1 | 4.35 | VI | |
| 1901.462 | 3 <i>n</i> | 212.20 | 4.32 | Means. | |
| 1902.632 | 3 <i>n</i> | 214.70 | 4.42 | | |
| 1903.396 | 3 <i>n</i> | 211.83 | 4.64 | | |
| 1904.617 | 1 <i>n</i> | 214.10 | 4.35 | | |

 β 814R. A., 16^h 23^m.9

Dec., +40° 6'

| | | | | | |
|----------|------|-------|------------------|------|----------------------------|
| 1897.630 | 18.7 | .... | .... | .... | Suspect elongation in 290° |
| .633 | 19.0 | 320.0 | 0.25 <i>est.</i> | IV | Elongated. |
| .660 | 19.4 | 324.5 | 0.35 <i>est.</i> | IV | Elongated. |
| .673 | 18.6 | 330.6 | 0.25 <i>est.</i> | IV | Doubtful elongation. |
| 1898.589 | 18.0 | 320.0 | 0.25 <i>est.</i> | IV | Elongated. |
| .610 | 19.3 | 320.2 | 0.30 <i>est.</i> | IV | Elongated. |
| 1899.540 | 18.3 | 322.0 | 0.25 <i>est.</i> | VIII | Elongated. |
| 1901.452 | 14.2 | 326.8 | 0.30 <i>est.</i> | VII | Elongated. |
| .465 | 14.6 | 321.0 | 0.25 <i>est.</i> | VIII | Not separated. |
| .477 | 14.8 | 323.6 | 0.25 <i>est.</i> | VIII | Elongated. |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece. | Remarks. |
|-------|----------|----------|----------|-----------|----------|
| | <i>h</i> | <i>o</i> | <i>s</i> | | |

 β 814—Continued.

| | | | | | |
|----------|------------|--------|------|--------|--|
| 1897.655 | 3 <i>n</i> | 325.03 | 0.28 | Means. | |
| 1898.600 | 2 <i>n</i> | 320.10 | 0.28 | | |
| 1899.540 | 1 <i>n</i> | 322.00 | 0.25 | | |
| 1901.465 | 3 <i>n</i> | 323.80 | 0.28 | | |

 β 815R. A., 16^h 23^m.9

Dec., +43° 8'

| | | | | | |
|----------|------------|--------|------|-------|--|
| 1903.401 | 14.6 | 340.0 | 9.32 | X | |
| .439 | 14.9 | 339.9 | 9.39 | X | |
| .445 | 13.9 | 338.1 | 9.46 | X | |
| 1903.428 | 3 <i>n</i> | 339.33 | 9.39 | Mean. | |

 α 2052R. A., 16^h 24^m.5

Dec., +18° 37'

| | | | | | |
|----------|------------|-------|------|--------|--------------------|
| 1902.637 | 18.1 | 91.6 | | | Cut off by clouds. |
| .642 | 19.4 | 90.5 | 1.55 | VI | |
| 1903.401 | 15.0 | 91.1 | 1.38 | III | |
| .439 | 14.4 | 93.2 | 1.44 | III | |
| 1906.508 | 16.6 | 89.9 | 0.98 | VII | |
| .562 | 17.3 | 87.0 | 1.28 | VII | |
| 1902.640 | 2 <i>n</i> | 91.05 | 1.55 | Means. | |
| 1903.420 | 2 <i>n</i> | 92.20 | 1.41 | | |
| 1906.535 | 2 <i>n</i> | 88.45 | 1.13 | | |

OBSERVATIONS OF DOUBLE STARS.

| Date. | Sid. T. | p | s | Eyepiece. | Remarks. |
|-------|---------|-----|-----|-----------|----------|
| | h | o | ° | | |

 β 817

R. A., 16h 28m.7

Dec., +23° 26'

| | | | | | |
|----------|------|--------|------|-------|--|
| 1902.527 | 17.7 | 146.7 | 0.98 | III | |
| .582 | 17.4 | 329.8 | 0.96 | VII | |
| .601 | 16.9 | 330.0 | 1.24 | VII | |
| 1903.439 | 14.7 | 146.8 | 1.00 | III | |
| 1902.787 | .... | 148.32 | 1.04 | Mean. | |

 β 819

R. A., 16h 31m.5

Dec., -4° 55'

| | | | | | |
|----------|------|--------|------|--------|---|
| 1902.601 | 18.1 | 235.7 | 1.5± | X | Impossible to measure distance. <i>Comes</i> at very limit of visibility. |
| .609 | 17.9 | 227.9 | 1.31 | V | |
| 1903.543 | 16.6 | ..... | .... | .... | Cannot see <i>comes</i> . |
| 1904.530 | 17.2 | 228.4 | 1.35 | X | Very difficult. |
| 1906.510 | .... | ..... | .... | .... | Cannot see <i>comes</i> . |
| 1902.605 | 2 n | 231.80 | 1.40 | Means. | |
| 1904.530 | 1 n | 228.40 | 1.35 | | |

 ζ HERCULIS

R. A., 16h 37m.5

Dec., +31° 47'

| | | | | | |
|----------|------|-------|------------------|---------|--------------------------------|
| 1807.630 | 19.2 | ..... | .... | IV | Cannot. |
| .633 | 17.3 | 352.0 | 0.20 <i>est.</i> | IV | Doubtful elongation. |
| .647 | 17.5 | ..... | .... | .... | Round. |
| 1898.553 | 18.0 | ..... | .... | Suspect | very slight elongation in 290° |
| .589 | 18.0 | .. . | .... | .... | Suspect elongation in 280° |
| 1899.537 | 17.8 | 268.2 | 0.76 | VII | Difficult. |
| .540 | 15.6 | 261.8 | 0.52 | VIII | Difficult. |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece. | Remarks. |
|-------|---------|----------|----------|-----------|----------|
| | h | ° | ' | | |

ζ HERCULIS—Continued.

| | | | | | |
|----------|------|-------|------|------|---------------|
| 1901.452 | 14.4 | 223.6 | 0.90 | VII | Very blurred. |
| .465 | 14.9 | 225.8 | 0.99 | VIII | Good. |
| .469 | 14.5 | 224.1 | 1.00 | VIII | Blurred. |
| .172 | 15.6 | 228.9 | .... | VIII | Very blurred. |
| .698 | 18.7 | 224.3 | 0.86 | VII | Good. |
| 1902.524 | 18.9 | 219.7 | 1.26 | VII | Blurred. |
| .574 | 17.6 | 217.2 | 1.09 | VII | Blurred. |
| .582 | 17.8 | 216.9 | 1.09 | VI | Blurred. |
| .593 | 17.1 | 219.2 | 1.07 | VII | Blurred. |
| 1903.396 | 15.2 | 205.4 | 1.45 | VII | Blurred. |
| .417 | 12.8 | 200.5 | 1.23 | VII | |
| .445 | 14.5 | 205.9 | 1.33 | VII | Difficult. |
| .557 | 16.4 | 196.8 | 1.11 | VII | |
| 1904.530 | 17.5 | 198.5 | 1.15 | VII | |
| .574 | 17.6 | 197.4 | 1.21 | VI | |
| .593 | 17.9 | 204.1 | 1.21 | VII | Blazing. |
| 1905.723 | 20.4 | 191.1 | 1.23 | VII | Poor seeing. |
| .726 | 19.7 | 193.3 | 1.15 | VII | Poor seeing. |
| 1906.510 | 17.4 | 182.8 | 1.16 | VII | Good. |
| .513 | 15.6 | 173.8 | 1.34 | VII | |
| .523 | 15.2 | 168.2 | 1.51 | VII | Daylight. |
| .541 | 15.6 | 174.2 | 1.28 | VII | |
| .549 | 15.4 | 170.7 | 1.21 | VII | |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece. | Remarks. |
|-------|---------|----------|----------|-----------|----------|
| | h | o | ' | | |

ζ HERCULIS—Continued.

| | | | | | |
|----------|-----|--------|------|--------|--|
| 1897.633 | 1 n | 352.00 | 0.20 | Means. | |
| 1899.538 | 2 n | 265.00 | 0.64 | | |
| 1901.511 | 5 n | 225.34 | 0.94 | | |
| 1902.568 | 4 n | 218.25 | 1.13 | | |
| 1903.454 | 4 n | 202.18 | 1.28 | | |
| 1904.566 | 3 n | 200.00 | 1.19 | | |
| 1905.724 | 2 n | 192.20 | 1.19 | | |
| 1906.527 | 5 n | 173.94 | 1.30 | | |

Ad. ζ 2091, (DEMBOWSKI).

R. A., 16h 40m.9

Dec., +43° 40'

| | | | | | |
|----------|------|-------|-------|------|--|
| 1897.630 | 19.0 | 332.8 | 0.56 | IV | Good. |
| .633 | 19.4 | 333.2 | 0.57 | IV | |
| .652 | 20.2 | 330.6 | 0.48 | IV | |
| 1898.589 | 18.8 | 325.3 | 0.51 | IV | Good. |
| .610 | 19.5 | 326.2 | 0.60 | IV | |
| .736 | 21.3 | 323.4 | 0.50 | IV | Blurred. |
| 1899.573 | 18.3 | 321.9 | 0.5 ± | VII | Separated by glimpses. |
| 1901.452 | 14.6 | 315.6 | 0.58 | VII | |
| .465 | 15.0 | 316.6 | 0.64 | VIII | Good. |
| .469 | 14.7 | 315.0 | 0.51 | VIII | Good. |
| 1902.524 | 18.7 | 308.0 | 0.56 | VII | The measured distance appears too great. |
| .601 | 18.3 | 313.3 | 0.64 | VII | |
| .699 | 19.7 | 312.8 | 0.57 | VIII | |
| 1903.396 | 15.0 | 310.2 | 0.57 | VII | Thro' clouds; very faint. |
| .453 | 14.2 | 309.2 | 0.56 | VII | Good. |
| .667 | 18.9 | 301.7 | 0.52 | VI | Separated by glimpses. |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece. | Remarks. |
|-------|----------|----------|----------|-----------|----------|
| | <i>h</i> | <i>o</i> | <i>u</i> | | |

Ad. Σ 2091. (DEMBOWSKI)—Continued.

| | | | | | |
|----------|------------|--------|-----------|--------|----------------------|
| 1904.593 | 18.2 | 300.1 | 0.44 | VIII | Not separated. |
| .617 | 18.6 | 301.6 | 0.49 | VII | Faint and difficult. |
| 1906.606 | 19.2 | 292.4 | 0.55 | VIII | |
| .751 | 20.3 | 117.4 | 0.38 | VIII | |
| .781 | 20.8 | 297.7 | 0.49 | VII | Not separated. |
| 1897.638 | 3 <i>n</i> | 332.20 | 0.54 | Means. | |
| 1898.645 | 3 <i>n</i> | 324.97 | 0.54 | | |
| 1899.573 | 1 <i>n</i> | 321.90 | 0.5 \pm | | |
| 1901.462 | 3 <i>n</i> | 315.73 | 0.58 | | |
| 1902.608 | 3 <i>n</i> | 311.37 | 0.59 | | |
| 1903.505 | 3 <i>n</i> | 307.03 | 0.55 | | |
| 1904.605 | 2 <i>n</i> | 300.85 | 0.46 | | |
| 1906.713 | 3 <i>n</i> | 295.83 | 0.47 | | |

 Σ 2106

R. A., 16h 46m.4

Dec., +9° 35'

| | | | | | |
|----------|------|-------|------------------|------|----------------------------|
| 1897.515 | 17.7 | 303.2 | 0.35 <i>est.</i> | IV | Poor seeing. |
| .652 | 20.0 | 296.0 | 0.40 <i>est.</i> | IV | Blurred. Not separated. |
| .660 | 18.0 | 300.6 | 0.44 | IV | Blurred. Not separated. |
| 1898.553 | 18.4 | 302.5 | 0.30 <i>est.</i> | IV | Cuneiform. |
| .562 | 18.9 | 298.4 | 0.30 <i>est.</i> | IV | Cuneiform. |
| .589 | 17.2 | 300.8 | 0.30 <i>est.</i> | IV | Cuneiform. |
| 1899.573 | 16.6 | 308.9 | 0.30 <i>est.</i> | VII | Elongated. |
| .586 | 18.9 | 287.3 | 0.30 <i>est.</i> | VII | Elongated. Very difficult. |
| 1901.465 | 16.3 | 316.0 | 0.20 <i>est.</i> | VIII | Elongated. |
| .469 | 16.1 | 300.0 | 0.25 <i>est.</i> | VIII | Elongated. |

10 OBS.

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece. | Remarks. |
|-------|----------|----------|----------|-----------|----------|
| | <i>h</i> | <i>o</i> | <i>r</i> | | |

Σ 2106—Continued.

| | | | | | |
|----------|------------|--------|------------------|--------|-------------------|
| 1902.524 | 18.5 | 283.7 | 0.30 <i>est.</i> | VII | Elongated. |
| .601 | 17.1 | 292.0 | 0.25 <i>est.</i> | VII | Elongated. |
| .609 | 17.2 | 303.6 | 0.35 <i>est.</i> | VII | Wedge. |
| 1903.453 | 14.4 | 299.3 | 0.25 <i>est.</i> | VII | Wedge. Difficult. |
| 1906.510 | 16.9 | 289.8 | 0.25 <i>est.</i> | VII | Wedge. |
| .513 | 15.8 | 300.6 | 0.25 <i>est.</i> | VII | Elongated. |
| .549 | 15.7 | 313.6 | 0.30 <i>est.</i> | VII | Elongated. |
| 1897.609 | 3 <i>n</i> | 299.93 | 0.40 | Means. | |
| 1898.568 | 3 <i>n</i> | 300.57 | 0.30 | | |
| 1899.580 | 2 <i>n</i> | 298.10 | 0.30 | | |
| 1901.467 | 2 <i>n</i> | 308.00 | 0.22 | | |
| 1902.578 | 3 <i>n</i> | 298.10 | 0.30 | | |
| 1903.453 | 1 <i>n</i> | 299.30 | 0.25 | | |
| 1906.524 | 3 <i>n</i> | 301.33 | 0.27 | | |

OΣ 315, 21 OPHIUCHI

R. A., 16^h 46^m.3

Dec., +1° 23'

| | | | | | |
|----------|------|-------|------|-----|----------|
| 1902.574 | 17.8 | 160.1 | 0.94 | VII | |
| .601 | 17.2 | 160.4 | 0.97 | VII | |
| .699 | 20.2 | 154.6 | .... | VI | |
| 1903.453 | 14.8 | 151.1 | 0.81 | VI | |
| .543 | 16.8 | 155.8 | 0.73 | VI | |
| .574 | 16.5 | 158.8 | 0.74 | VII | Blurred. |
| 1904.593 | 18.4 | 160.1 | 0.74 | VII | Blurred. |
| .598 | 18.2 | 160.4 | 0.94 | VII | |
| 1906.510 | 17.0 | 156.2 | 0.77 | VII | |
| .541 | 16.2 | 158.9 | 0.73 | VI | |
| .549 | 16.0 | 156.2 | 0.70 | VII | |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece. | Remarks. |
|-------|---------|----------|----------|------------|----------|
| | h | o | ' | | |

O α 315, 21, OPHIUCHI—Continued.

| | | | | | |
|----------|-----|--------|------|--------|--|
| 1902.625 | 3 n | 158.37 | 0.96 | Means. | |
| 1903.523 | 3 n | 155.23 | 0.76 | | |
| 1904.596 | 2 n | 160.25 | 0.84 | | |
| 1906.533 | 3 n | 156.82 | 0.73 | | |

 α 2107

R. A., 16h 47m.9

Dec., +28° 50'

| | | | | | |
|----------|------|-------|------------------|------|-----------------------------|
| 1897.630 | 19.3 | 304.8 | 0.50 | IV | |
| .633 | 19.6 | 305.3 | 0.40 <i>est.</i> | IV | Blurred. |
| .660 | 18.2 | 307.9 | 0.40 <i>est.</i> | IV | Not separated. |
| 1898.553 | 18.6 | 310.7 | 0.35 <i>est.</i> | IV | Separated at times. |
| .610 | 18.9 | 310.4 | 0.47 | IV | Just separated. |
| 1901.452 | 15.0 | ..... | .... | .... | Suspect elongation in 320'. |
| .465 | 15.3 | 326.2 | 0.30 <i>est.</i> | VIII | Wedge shaped. |
| .469 | 15.3 | 332.8 | 0.35 <i>est.</i> | VIII | Wedge, |
| .472 | 14.9 | 324.0 | 0.25 <i>est.</i> | VIII | Wedge. |
| .477 | 15.8 | 334.5 | 0.35 <i>est.</i> | VIII | Wedge. |
| 1902.582 | 18.1 | 337.2 | 0.40 <i>est.</i> | VII | |
| .601 | 17.4 | 343.9 | 0.45 <i>est.</i> | VII | Barely separated, |
| .694 | 20.4 | 336.1 | 0.40 | VII | |
| 1903.453 | 14.6 | 339.3 | 0.35 <i>est.</i> | VIII | Difficult. |
| .557 | 16.7 | 340.3 | 0.36 | VII | Difficult. |
| 1906.513 | 15.9 | 352.4 | 0.54 | VII | Barely separated. |
| .549 | 15.9 | 354.2 | 0.54 | VII | Daylight. |

OBSERVATIONS OF DOUBLE STARS.

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece. | Remarks. |
|-------|----------|----------|----------|------------|----------|
| | <i>h</i> | <i>o</i> | <i>'</i> | | |

Σ 2107—Continued.

| | | | | | |
|----------|-----|--------|------|--------|--|
| 1897.641 | 3 n | 306.00 | 0.43 | Means. | |
| 1898.582 | 2 n | 310.55 | 0.41 | | |
| 1901.471 | 4 n | 329.38 | 0.31 | | |
| 1902.627 | 3 n | 339.07 | 0.42 | | |
| 1903.506 | 2 n | 339.80 | 0.36 | | |
| 1906.531 | 2 n | 353.30 | 0.54 | | |

β 821

R. A., 16h 48m.5

Dec., +32° 1'

| | | | | | |
|----------|------|--------|------|-------|--|
| 1902.601 | 17.6 | 312.6 | 1.20 | III | |
| .609 | 17.3 | 313.4 | 1.34 | VII | |
| .699 | 20.7 | 312.6 | 1.28 | VII | |
| 1902.636 | 3 n | 312.87 | 1.27 | Mean. | |

Σ 2118, 20 DRACONIS

R. A., 16h 55m.9

Dec., +65° 11'

| | | | | | |
|----------|------|-------|------------------|-------|-----------------------|
| 1901.452 | 14.9 | 94.0 | 0.25 <i>est.</i> | VII | Elongated. |
| .465 | 15.7 | 90.4 | 0.20 <i>est.</i> | VIII | Slight elongation. |
| .477 | 15.0 | 77.6 | 0.25 <i>est.</i> | VIII | Elongated. Difficult. |
| 1901.465 | 3 n | 87.33 | 0.23 | Mean. | |

| Date. | Sid. T. | p | s | Eyepiece. | Remarks. |
|-------|---------|-----|-----|-----------|----------|
| | h | o | . | | |

Σ 2120

R. A., 17^h 0^m.4

Dec., +28° 15'

| | | | | | |
|----------|----------------|--------|------|-------|--|
| 1903.608 | 18.9 | 241.8 | 8.60 | V | |
| .611 | 18.9 | 241.0 | 8.71 | VI | |
| 1903.608 | 2 ⁿ | 241.40 | 8.66 | Mean. | |

β 823. B.D.+0°, 3633

R. A., 17^h 1^m.5

Dec., +0° 47'

| | | | | | |
|----------|----------------|-------|------|--------|-------|
| 1902.582 | 18.4 | 12.5 | 1.12 | VI | |
| .601 | 17.9 | 11.1 | 1.09 | III | |
| .699 | 20.0 | 11.4 | 1.01 | VI | |
| 1903.543 | 17.0 | 13.9 | 1.11 | VI | Good. |
| .557 | 16.9 | 12.3 | 0.92 | VI | Good. |
| .574 | 16.7 | 12.5 | 0.85 | VI | |
| 1904.574 | 17.8 | 15.3 | 0.97 | VI | |
| .598 | 18.4 | 15.3 | 1.06 | VII | |
| 1906.508 | 16.9 | 16.1 | 0.89 | VII | |
| .510 | 17.2 | 16.6 | 0.85 | VII | |
| .541 | 16.3 | 13.0 | 1.03 | VII | |
| 1902.627 | 3 ⁿ | 11.67 | 1.07 | Means. | |
| 1903.558 | 3 ⁿ | 12.90 | 0.96 | | |
| 1904.586 | 2 ⁿ | 15.30 | 1.02 | | |
| 1906.520 | 3 ⁿ | 15.23 | 0.92 | | |

OBSERVATIONS OF DOUBLE STARS.

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece. | Remarks. |
|-------|----------|----------|----------|------------|----------|
| | <i>h</i> | <i>o</i> | <i>r</i> | | |

 Σ 2130, μ DRACONISR. A., 17^h 3^m.4

Dec., +54° 36'

| | | | | | |
|----------|------------|--------|------|--------|-------------|
| 1902.601 | 18.6 | 143.6 | 2.54 | III | |
| .699 | 21.6 | 146.0 | 2.47 | V | |
| .702 | 19.8 | 145.0 | 2.52 | III | |
| 1903.417 | 13.0 | 144.6 | 2.36 | VII | |
| .445 | 15.2 | 143.6 | 2.54 | VI | |
| .448 | 13.9 | 144.2 | 2.52 | VI | |
| 1904.617 | 18.2 | 144.1 | 2.35 | VI | |
| .786 | 20.8 | 143.0 | 2.33 | VI | Bad seeing. |
| 1905.723 | 20.7 | 140.4 | 2.53 | VI | Bad seeing. |
| .726 | 20.2 | 140.3 | 2.62 | V | Bad seeing. |
| 1906.541 | 15.8 | 140.4 | 2.44 | VI | |
| .560 | 15.8 | 138.8 | 2.28 | VI | Good. |
| .562 | 16.3 | 143.1 | 2.36 | VII | |
| 1902.667 | 3 <i>n</i> | 144.87 | 2.51 | Means. | |
| 1903.437 | 3 <i>n</i> | 144.13 | 2.47 | | |
| 1904.702 | 2 <i>n</i> | 143.55 | 2.34 | | |
| 1905.724 | 2 <i>n</i> | 140.35 | 2.57 | | |
| 1906.554 | 3 <i>n</i> | 140.77 | 2.36 | | |

 η OPHIUCHIR. A., 17^h 4^m.7

Dec., -15° 35'

| | | | | | |
|----------|------|------------------|-----------------|-----|------------|
| 1902.524 | 18.0 | 250° <i>est.</i> | 0.5 <i>est.</i> | VII | Elongated. |
| .609 | 17.7 | 252.7 | 0.41 | VII | Blurred. |
| 1903.557 | 17.4 | 248.1 | 0.63 | VII | |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece. | Remarks. |
|-------|---------|----------|----------|-----------|----------|
| | h | o | ' | | |

 η OPHIUCHI—Continued.

| | | | | | |
|----------|------|--------|------|--------|------------------------|
| 1903.890 | 18.4 | 249.9 | 0.41 | VIII | |
| 1904.530 | 17.7 | 241.9 | 0.50 | VII | Separated. |
| .617 | 17.1 | 246.7 | 0.43 | VII | Very blurred. |
| 1906.560 | 15.5 | 244.3 | 0.41 | VIII | Blurred but separated. |
| .562 | 17.5 | 245.1 | 0.54 | VII | Blurred. |
| .606 | 17.1 | 247.7 | 0.49 | VIII | Very bad seeing. |
| 1902.566 | 2 n | 251.35 | 0.46 | Means. | |
| 1903.624 | 2 n | 249.00 | 0.52 | | |
| 1904.574 | 2 n | 244.30 | 0.46 | | |
| 1906.576 | 3 n | 245.70 | 0.48 | | |

 β 416R. A., 17^h 10^m.8

Dec., —34° 51'

| | | | | | |
|----------|------|-------|------|-----|---------------|
| 1897.633 | 17.9 | 305.9 | 1.52 | IV | |
| .636 | 18.0 | 304.9 | 1.70 | III | Very blurred. |
| 1898.589 | 17.5 | 301.2 | 1.61 | IV | |
| .602 | 17.7 | 309.9 | 1.41 | V | Very blurred. |
| 1899.567 | 17.5 | 297.7 | 1.83 | V | Very blurred. |
| .573 | 16.8 | 298.7 | 1.71 | V | Very blurred. |
| .594 | 17.4 | 296.9 | 1.78 | V | |
| 1902.524 | 17.8 | 289.7 | 1.74 | VII | Very blurred. |
| .609 | 17.5 | 287.4 | 1.70 | V | |
| 1903.543 | 17.2 | 281.5 | 1.96 | VI | Blurred. |
| .557 | 17.5 | 284.6 | 1.88 | VI | |
| 1904.617 | 17.2 | 283.3 | 1.69 | X | |
| 1906.513 | 17.4 | 272.5 | 2.19 | VI | Very blurred. |
| .560 | 17.4 | 273.3 | 1.97 | X ; | |

| Date. | Sid. T. | p | s | Eyepiece. | Remarks. |
|-------|---------|-----|-----|-----------|----------|
| | h | ° | ' | | |

 β 416—Continued.

| | | | | | |
|----------|-----|--------|------|--------|--|
| 1897.634 | 2 n | 305.40 | 1.61 | Means. | |
| 1898.596 | 2 n | 305.55 | 1.51 | | |
| 1899.578 | 3 n | 297.47 | 1.77 | | |
| 1902.566 | 2 n | 288.55 | 1.72 | | |
| 1903.550 | 2 n | 283.05 | 1.92 | | |
| 1904.617 | 1 n | 283.30 | 1.69 | | |
| 1906.536 | 2 n | 272.90 | 2.08 | | |

 Σ 2173R. A., 17^h 25^m.2Dec., $-0^{\circ} 59'$

| | | | | | |
|----------|------|-------|------|------|---------------|
| 1897.515 | 17.9 | 156.2 | 1.12 | IV | Very blurred. |
| .636 | 18.2 | 335.7 | 1.22 | IV | |
| .647 | 19.3 | 151.9 | 1.09 | IV | Very blurred. |
| 1898.589 | 17.7 | 154.1 | 1.07 | IV | Good. |
| .608 | 17.2 | 153.1 | 0.98 | IV | |
| 1899.564 | 18.6 | 333.9 | 1.20 | VII | |
| .567 | 17.5 | 333.0 | 1.03 | VII | |
| .573 | 17.0 | 333.7 | 1.02 | VII | |
| 1901.458 | 16.2 | 331.4 | 0.78 | VII | Blurred. |
| .460 | 16.2 | 333.6 | 0.85 | VII | Very blurred. |
| .472 | 16.1 | 333.1 | 0.92 | VII | Very blurred. |
| .477 | 16.1 | 330.8 | 0.77 | VIII | Very blurred. |
| 1902.524 | 18.1 | 333.9 | 0.93 | VII | Blurred. |
| .609 | 18.2 | 331.9 | 0.98 | VII | |
| .664 | 20.2 | 148.8 | 0.91 | VI | |
| 1903.543 | 17.9 | 329.3 | 0.99 | VII | |
| .557 | 17.7 | 148.7 | 0.96 | VI | |
| .574 | 16.8 | 328.1 | 0.84 | VI | |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece. | Remarks. |
|-------|----------|----------|----------|------------|----------|
| | <i>h</i> | <i>o</i> | <i>r</i> | | |

Σ 2173—Continued.

| | | | | | |
|----------|------------|--------|------|--------|---------------|
| 1904.617 | 17.4 | 328.5 | 0.81 | VI | Very blurred. |
| .792 | 21.1 | 145.1 | 0.76 | VI | |
| 1906.513 | 17.6 | 143.2 | 0.78 | VI | |
| .541 | 16.5 | 141.2 | 0.67 | VII | |
| .560 | 17.6 | 140.2 | 0.70 | VII | |
| 1897.599 | 3 <i>n</i> | 334.60 | 1.14 | Means. | |
| 1898.598 | 2 <i>n</i> | 333.60 | 1.02 | | |
| 1899.568 | 3 <i>n</i> | 333.53 | 1.08 | | |
| 1901.467 | 4 <i>n</i> | 332.22 | 0.83 | | |
| 1902.599 | 3 <i>n</i> | 331.53 | 0.94 | | |
| 1903.558 | 3 <i>n</i> | 328.70 | 0.93 | | |
| 1904.704 | 2 <i>n</i> | 326.80 | 0.78 | | |
| 1906.538 | 3 <i>n</i> | 321.53 | 0.72 | | |

Σ 2220. μ^2 HERCULIS, B C.R. A., 17^h 42^m.5

Dec., +27° 47'

| | | | | | |
|----------|------|------|------|-----|-----------------|
| 1897.652 | 18.4 | 49.9 | 1.51 | IV | |
| .660 | 18.4 | 51.8 | 1.39 | IV | |
| .671 | 18.7 | 52.2 | 1.39 | IV | |
| 1898.553 | 18.9 | 50.8 | 1.36 | IV | Difficult. |
| .610 | 19.7 | 52.7 | 1.51 | IV | Very difficult. |
| .739 | 19.9 | 51.9 | 1.36 | III | Difficult. |
| 1899.564 | 18.9 | 56.7 | 1.65 | VII | Very difficult. |
| .594 | 18.4 | 51.7 | 1.66 | V | Good. |

11 OBS.

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece. | Remarks. |
|-------|---------|----------|----------|-----------|----------|
| | h | o | ' | | |

 μ^2 HERCULIS—Continued.

| | | | | | |
|----------|------|-------|------|--------|------------------------------|
| 1901.433 | 15.3 | 57.4 | 1.33 | VII | Poor, especially in distance |
| .452 | 15.4 | 59.6 | 1.59 | VI | Faint and difficult. |
| .458 | 16.6 | 60.9 | 1.39 | VII | Difficult. |
| 1902.609 | 18.6 | 60.5 | 1.50 | V | Good. |
| .653 | 19.8 | 62.5 | 1.63 | VI | Difficult. |
| .699 | 21.8 | 61.5 | 1.62 | V | Very faint and difficult. |
| 1903.557 | 17.9 | 63.2 | 1.43 | VI | Good. |
| .574 | 17.0 | 63.8 | 1.32 | V | |
| .664 | 20.2 | 66.4 | 1.65 | VI | Good. |
| 1904.617 | 18.9 | 64.9 | 1.40 | V | |
| .786 | 21.1 | 67.4 | 1.41 | X | Good. |
| 1906.513 | 16.1 | 74.1 | 1.43 | VI | Good. |
| .524 | 15.6 | 77.8 | 1.51 | VI | Very faint. |
| .549 | 16.3 | 71.3 | 1.36 | VII | |
| .560 | 17.8 | 71.2 | 1.09 | VII | Difficult. |
| 1897.661 | 3 n | 51.30 | 1.43 | Means. | |
| 1898.634 | 3 n | 51.80 | 1.41 | | |
| 1999.579 | 2 n | 54.20 | 1.65 | | |
| 1901.448 | 3 n | 59.30 | 1.44 | | |
| 1902.654 | 3 n | 61.50 | 1.58 | | |
| 1903.598 | 3 n | 64.47 | 1.47 | | |
| 1904.701 | 2 n | 66.15 | 1.40 | | |
| 1906.536 | 4 n | 73.60 | 1.35 | | |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece. | Remarks. |
|-------|----------|----------|-----------|-----------|----------|
| | <i>h</i> | <i>o</i> | <i>."</i> | | |

O Σ 338R. A., 17^h 47^m.5

Dec., +15° 21'

| | | | | |
|--|------|--------|-------|--------|
| 1902.524 | 18.3 | 193.8 | 0.63 | VII |
| .609 | 19.4 | 17.1 | 0.83 | VI |
| .653 | 20.0 | 195.4 | 0.57 | VII |
| 1903.557 | 18.0 | 12.8 | 0.68 | VII |
| .574 | 17.2 | 12.9 | 0.69 | VII |
| .664 | 20.4 | 14.7 | 0.81 | VI |
| 1904.786 | 21.3 | 196.5 | 0.76 | VI |
| 1906.513 | 16.3 | 11.0 | 0.83 | VI |
| .549 | 16.5 | 12.1 | 0.79 | VII |
| .562 | 17.7 | 191.6 | 0.72 | VII |
| 1902.595 | 3 n | 195.43 | 0.68 | Means. |
| 1903.598 | 3 n | 193.47 | 0.73 | |
| 1904.786 | 1 n | 196.50 | 0.76 | |
| 1906.541 | 3 n | 191.57 | 0.78 | |
| A distant companion, 10 ^m . | | | | |
| 1906.562 | 18.0 | 251.18 | 95.20 | X |

 Σ 2262, τ OPHIUCHIR. A., 17^h 57^m.6

Dec., -8° 11'

| | | | | | |
|----------|------|-------|------|-----|----------|
| 1901.433 | 15.6 | 252.6 | 1.93 | III | |
| .458 | 16.4 | 255.8 | 1.88 | VII | |
| .633 | 17.7 | 255.7 | 1.83 | VI | |
| 1902.609 | 18.4 | 254.4 | 2.02 | V | |
| .653 | 19.5 | 255.8 | 1.82 | VI | |
| .664 | 20.0 | 255.4 | 2.13 | III | Blurred. |

| Date. | Sid. T. | p | s | Eyepiece. | Remarks. |
|-------|---------|-----|-----|-----------|----------|
| | h | o | r | | |

 τ OPHIUCHI—Continued.

| | | | | | |
|----------|-------|--------|------|--------|--------------------------------------|
| 1903.552 | 16.8 | 254.8 | 2.12 | III | Blurred. Through fog. |
| .574 | 17.4 | 254.8 | 1.93 | VII | |
| .667 | 18.2 | 255.9 | 1.75 | VI | |
| 1904.574 | 18.0 | 256.0 | 2.06 | VI | |
| .767 | 21.2 | 253.4 | 1.71 | VI | |
| 1901.508 | 3 n | 254.70 | 1.88 | Means. | |
| 1902.642 | 3 n | 255.20 | 1.99 | | |
| 1903.598 | 3 n | 255.17 | 1.93 | | |
| 1904.670 | 2 n | 254.10 | 1.88 | | |

 Σ 2272, 70 OPHIUCHIR. A., 18^h 0m.4

Dec., +2° 31'

| | | | | | |
|----------|------|-------|------|-----|---------------------------------|
| 1897.633 | 19.9 | 280.9 | 2.02 | IV | Blurred. |
| .636 | 19.4 | 280.1 | 2.11 | IV | Blurred. |
| .644 | 19.2 | 278.7 | 2.08 | IV | Unsteady. |
| .652 | 19.5 | 280.4 | 2.16 | IV | |
| .671 | 18.5 | 278.9 | 1.94 | IV | |
| 1898.537 | 18.1 | 269.9 | 1.84 | IV | |
| .553 | 19.2 | 269.2 | 1.81 | IV | |
| .600 | 18.3 | 271.8 | 1.78 | IV | Very bad seeing. |
| .608 | 18.4 | 269.8 | 2.02 | IV | Very bad seeing. |
| .714 | 19.0 | 270.1 | 1.78 | IV | Good. |
| 1899.564 | 18.2 | 259.0 | 1.69 | VII | Unsteady. |
| .567 | 18.2 | 257.9 | 1.87 | VII | Very blurred. |
| .573 | 18.0 | 257.1 | 1.78 | VII | Blurred. |
| .581 | 18.5 | 258.1 | 1.57 | VII | Thro' grating; very bad seeing. |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece. | Remarks. |
|-------|---------|----------|----------|-----------|----------|
| | h | ° | ' | | |

70 OPHIUCHI—Continued.

| | | | | | |
|----------|------|-------|------|-----|---------------|
| 1899.586 | 18.3 | 258.1 | 1.82 | VII | Good. |
| .594 | 17.9 | 257.9 | 1.80 | VII | |
| 1901.452 | 16.0 | 230.1 | 1.87 | VI | Blurred. |
| .625 | 17.3 | 228.6 | 1.55 | III | |
| .633 | 18.0 | 225.4 | 1.55 | VII | Unsteady. |
| .698 | 18.3 | 225.1 | 1.54 | VII | |
| .725 | 19.1 | 228.0 | 1.49 | VII | Good. |
| 1902.582 | 18.5 | 211.7 | 1.84 | VI | |
| .609 | 18.8 | 209.9 | 1.86 | III | |
| .653 | 19.3 | 214.4 | 1.66 | VII | |
| .688 | 20.8 | 214.4 | 1.79 | III | Blurred. |
| 1903.527 | 16.2 | 195.8 | 1.93 | VI | Very blurred. |
| .532 | 18.4 | 198.0 | 1.78 | VI | |
| .574 | 18.2 | 198.8 | 2.11 | VI | |
| .667 | 18.4 | 193.7 | 1.79 | VI | |
| 1904.574 | 18.2 | 187.0 | 2.10 | VI | |
| .617 | 19.1 | 187.9 | 2.08 | VI | |
| .767 | 21.0 | 189.2 | 2.08 | VI | |
| .792 | 21.3 | 186.9 | 2.03 | VI | |
| 1905.721 | 20.5 | 182.1 | 2.43 | VI | Poor. |
| .723 | 20.2 | 181.3 | 2.37 | VI | |
| .726 | 19.9 | 180.5 | 2.70 | V | |
| .808 | 21.3 | 178.8 | 2.32 | VI | |
| 1906.513 | 17.1 | 170.9 | 2.52 | VI | |
| .524 | 15.4 | 169.1 | 2.42 | VII | |
| .549 | 17.2 | 172.7 | 2.50 | VII | |
| .606 | 18.4 | 171.9 | 2.56 | VI | |

OBSERVATIONS OF DOUBLE STARS.

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece. | Remarks. |
|-------|----------|----------|----------|-----------|----------|
| | <i>h</i> | <i>o</i> | <i>o</i> | | |

70 OPHIUCHI—Continued.

| | | | | | |
|----------|------------|--------|------|--------|--|
| 1897.647 | 5 <i>n</i> | 279.80 | 2.06 | Means. | |
| 1898.602 | 5 <i>n</i> | 270.16 | 1.85 | | |
| 1899.578 | 6 <i>n</i> | 258.02 | 1.76 | | |
| 1901.627 | 5 <i>n</i> | 227.44 | 1.60 | | |
| 1902.633 | 4 <i>n</i> | 212.60 | 1.79 | | |
| 1903.550 | 4 <i>n</i> | 196.58 | 1.90 | | |
| 1904.687 | 4 <i>n</i> | 187.75 | 2.07 | | |
| 1905.744 | 4 <i>n</i> | 180.67 | 2.46 | | |
| 1906.548 | 4 <i>n</i> | 171.15 | 2.50 | | |

OZ 341

R, A., 18^h 1^m.6

Dec., +21° 26'

| | | | | | |
|----------|------------|-------|------|--------|-------------------|
| 1903.557 | 18.2 | 91.2 | 0.40 | VII | Barely separated. |
| .664 | 20.6 | 88.0 | 0.41 | VIII | Hardly separated. |
| .667 | 18.6 | 92.6 | 0.46 | VII | Not separated. |
| 1906.513 | 16.5 | 94.0 | 0.65 | .... | Separated. |
| .562 | 18.3 | 93.6 | 0.45 | VII | |
| .606 | 18.6 | 90.3 | 0.42 | VIII | Barely separated. |
| 1903.629 | 3 <i>n</i> | 90.60 | 0.42 | Means. | |
| 1906.560 | 3 <i>n</i> | 92.63 | 0.51 | | |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece. | Remarks. |
|-------|----------|----------|----------|-----------|----------|
| | <i>h</i> | <i>o</i> | <i>'</i> | | |

99 HERCULIS

R. A., 18h 3m.2

Dec., +30° 33'

| | | | | | |
|----------|------|--------|------|--------|-----------------------------|
| 1897.660 | 18.7 | 312.7 | 1.12 | IV | |
| .671 | 19.0 | 309.9 | 1.01 | IV | |
| .701 | 19.6 | 315.2 | 1.00 | IV | Blurred. |
| 1899.586 | 18.6 | 322.8 | 1.17 | VII | |
| 1901.452 | 15.7 | 324.4 | 1.54 | VII | Very blurred. Poor. |
| .458 | 16.9 | 325.4 | 1.44 | VII | Very blurred. |
| .469 | 15.7 | 328.1 | 1.41 | III | |
| 1902.601 | 18.8 | 323.0 | 1.64 | VI | Very blurred. |
| .609 | 19.2 | 323.5 | 1.65 | VI | Blurred. |
| .759 | 19.8 | 318.2 | 1.36 | VII | Good. |
| 1903.552 | 17.0 | 328.4 | 1.73 | VII | Very blurred and difficult. |
| .664 | 20.8 | 327.1 | 1.32 | VI | |
| .674 | 18.6 | 329.3 | 1.37 | VI | Bad definition. |
| 1904.792 | 21.5 | 322.9 | 1.24 | VII | |
| 1906.513 | 16.7 | 332.8 | 1.46 | VI | |
| .549 | 16.6 | 331.6 | 1.43 | VII | Good. |
| .568 | 16.3 | 330.7 | 1.59 | VI | Bad seeing. |
| 1897.677 | 3 " | 312.60 | 1.04 | Means. | |
| 1899.586 | 1 " | 322.80 | 1.17 | | |
| 1901.460 | 3 " | 325.97 | 1.46 | | |
| 1902.656 | 3 " | 321.23 | 1.55 | | |
| 1903.663 | 3 " | 328.27 | 1.47 | | |
| 1904.792 | 1 " | 322.90 | 1.24 | | |
| 1906.543 | 3 " | 331.70 | 1.49 | | |

OBSERVATIONS OF DOUBLE STARS.

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece. | Remarks. |
|--|------------|----------|------------------|------------|-----------------------------|
| | <i>h</i> | <i>o</i> | <i>r</i> | | |
| Σ 2281 | | | | | |
| R. A., 18 ^h 4 ^m .6 | | | Dec., +3° 58' | | |
| 1897.660 | 19.2 | 230.1 | 0.30 <i>est.</i> | IV | Cuneiform. |
| .671 | 19.2 | 235.6 | 0.35 <i>est.</i> | IV | Cuneiform. |
| .701 | 19.3 | 232.6 | 0.40 <i>est.</i> | IV | Elongated. |
| 1898.589 | 19.2 | 231.4 | 0.25 <i>est.</i> | IV | Elongated. |
| .610 | 18.7 | 233.4 | 0.25 <i>est.</i> | IV | Very slight elongation. |
| 1901.698 | 18.5 | ..... | .... | VII | Single. |
| .725 | 19.2 | ..... | .... | .... | Doubtful elongation in 170° |
| 1902.609 | 19.5 | ..... | .... | VII | Single. |
| .759 | 20.0 | ..... | .... | VII | Round. |
| 1903.557 | 18.3 | ..... | .... | VII | Single. |
| .690 | 18.6 | ..... | .... | VIII | Cannot. |
| 1906.549 | 16.7 | ..... | .... | .... | Suspect elongation in 140° |
| 1897.677 | 3 <i>n</i> | 232.77 | 0.35 | Means. | |
| 1898.600 | 2 <i>n</i> | 232.40 | 0.25 | | |

Σ 2315

R. A., 18^h 21^m.0

Dec., +27° 20'

| | | | | | |
|----------|------|-------|------------------|------|-------------------------|
| 1897.660 | 19.0 | 206.1 | 0.30 <i>est.</i> | IV | Elongated. |
| .671 | 19.3 | 213.6 | 0.25 <i>est.</i> | IV | Elongated. |
| .744 | 19.7 | 213.3 | 0.25 <i>est.</i> | IV | Elongated. |
| 1901.725 | 19.3 | 199.7 | 0.25 <i>est.</i> | VII | Wedge. |
| .759 | 20.1 | 198.5 | 0.25 <i>est.</i> | VII | Very slight elongation. |
| 1903.557 | 18.4 | 218.8 | 0.20 <i>est.</i> | VII | Elongated. |
| .664 | 20.9 | ..... | .... | .... | Cannot. |
| .690 | 18.7 | ..... | .... | VIII | Cannot. |
| 1906.549 | 16.8 | 195.5 | 0.20 <i>est.</i> | VII | Wedge. |
| .587 | 18.0 | 196.1 | 0.25 <i>est.</i> | VII | Elongated. |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece. | Remarks. |
|-------|----------|----------|----------|------------|----------|
| | <i>h</i> | <i>o</i> | <i>r</i> | | |

Σ 2315—Continued.

| | | | | | |
|----------|------------|--------|------|--------|--|
| 1897.692 | 3 <i>n</i> | 211.00 | 0.27 | Means. | |
| 1901.742 | 2 <i>n</i> | 199.10 | 0.25 | | |
| 1903.557 | 1 <i>n</i> | 218.80 | 0.20 | | |
| 1906.568 | 2 <i>n</i> | 195.80 | 0.22 | | |

OΣ 353, φ DRACONIS

R. A., 18^h 22^m.2

Dec., +71° 17'

| | | | | | |
|----------|------|------|------------------|------|---------------------|
| 1897.660 | 19.8 | 45.0 | 0.46 | IV | |
| .722 | 19.4 | 44.7 | 0.56 | IV | Very blurred. |
| 1901.833 | 21.8 | 62.6 | 0.30 <i>est.</i> | VIII | Elongated. Blurred. |
| 1906.560 | 16.0 | 43.7 | 0.35 | VIII | Not separated. |

Σ 2400. A, $\frac{1}{2}(B+C)$.R. A., 18^h 43^m.5

Dec., +16° 7'

| | | | | | |
|----------|------|-------|------|-----|--------------------|
| 1897.636 | 19.0 | 186.4 | 2.75 | II | |
| .644 | 19.5 | 187.8 | 2.76 | II | |
| 1901.633 | 18.2 | 179.6 | 2.25 | VII | A B |
| .698 | 19.1 | 183.4 | 2.89 | XI | |
| .725 | 19.7 | 186.0 | 2.95 | V | |
| 1902.653 | 20.7 | 182.4 | .... | VI | Cut off by clouds. |
| .794 | 21.0 | 186.6 | 2.87 | V | |
| 1903.557 | 18.6 | 182.8 | 3.06 | VI | |
| .664 | 21.0 | 181.5 | 3.04 | III | |
| .690 | 19.4 | 181.6 | 2.98 | V | |

12 OBS.

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece. | Remarks. |
|-------|---------|----------|----------|-----------|----------|
| | h | o | . | | |

Σ 2400. A, $\frac{1}{2}(B+C)$ —Continued.

| | | | | | |
|----------|--------------|--------|------|--------|--|
| 1904.825 | 21.9 | 181.0 | 3.06 | III | |
| .833 | 22.3 | 187.2 | 2.90 | V | |
| 1906.549 | 17.4 | 177.6 | 3.02 | VI | |
| .587 | 18.2 | 181.5 | 3.19 | VII | |
| 1897.640 | 2 <i>n</i> | 187.10 | 2.76 | Means. | |
| 1901.685 | 3 <i>n</i> | 183.80 | 2.84 | | |
| 1902.724 | 2-1 <i>n</i> | 184.50 | 2.87 | | |
| 1903.637 | 3 <i>n</i> | 181.97 | 3.02 | | |
| 1904.829 | 2 <i>n</i> | 184.10 | 2.98 | | |
| 1906.568 | 2 <i>n</i> | 179.55 | 3.10 | | |

Σ 2400, B C.

R. A., 18h 43m.5

Dec., +16° 7'

| | | | | | |
|----------|------|-------|------|-----|-----------------|
| 1897.636 | 19.2 | 194.5 | 0.52 | III | |
| .644 | 19.7 | 200.4 | 0.48 | III | |
| 1901.633 | 18.4 | 189.8 | 0.75 | VII | Difficult. |
| .698 | 18.9 | 16.0 | 0.93 | VII | |
| .725 | 19.5 | 20.0 | 0.89 | VII | |
| 1903.557 | 18.7 | 14.4 | 0.96 | VII | |
| .664 | 21.3 | 203.4 | 0.82 | VI | Very difficult. |
| .690 | 19.2 | 22.8 | 0.97 | VI | |
| 1904.841 | 23.1 | 21.2 | 0.76 | X | |
| 1906.549 | 17.5 | 14.3 | 0.71 | VI | Very difficult. |
| .587 | 18.3 | 195.0 | 0.71 | VII | Difficult. |

| Date. | Sid. T. | p | s | Eyepiece. | Remarks. |
|-------|---------|-----|-----|-----------|----------|
| | h | ° | ' | | |

Σ 2400, B C.—Continued.

| | | | | | |
|----------|-----|--------|------|--------|--|
| 1897.640 | 2 n | 197.45 | 0.50 | Means. | |
| 1901.685 | 3 n | 195.27 | 0.86 | | |
| 1903.637 | 3 n | 200.20 | 0.92 | | |
| 1904.841 | 1 n | 201.20 | 0.86 | | |
| 1906.568 | 2 n | 194.65 | 0.71 | | |

Σ 2402

R. A., 18h 45m.0

Dec., +10° 34'

| | | | | | |
|----------|------|--------|------|-------|--|
| 1902.702 | 20.2 | 204.2 | 1.12 | V | |
| .794 | 21.2 | 210.8 | 1.09 | VI | |
| 1906.513 | 17.8 | 203.4 | 1.02 | VI | |
| 1902.748 | 2 n | 207.50 | 1.10 | Mean. | |

β 648

R. A., 18h 53m.3

Dec., +32° 46'

| | | | | | |
|----------|------|-------|------|-----|------------------|
| 1897.644 | 20.2 | 234.1 | 1.25 | IV | |
| .660 | 20.3 | 233.3 | 1.34 | IV | |
| .671 | 18.6 | 227.3 | 1.25 | IV | |
| 1398.610 | 20.0 | 230.3 | 1.29 | IV | Very bad seeing. |
| .613 | 17.9 | 229.3 | 1.25 | IV | Good. |
| .739 | 21.0 | 231.2 | 1.46 | III | Blurred. |
| 1898.578 | 17.2 | 222.0 | 1.24 | VII | |
| 1901.725 | 20.0 | 222.8 | 1.15 | VII | |
| .737 | 19.0 | 215.3 | 1.09 | VII | |
| .743 | 19.9 | 219.3 | 1.13 | VII | |

OBSERVATIONS OF DOUBLE STARS.

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece. | Remarks. |
|-------|---------|----------|----------|------------|----------|
| | h | o | " | | |

 β 648—Continued.

| | | | | | |
|----------|------|--------|------|--------|------------|
| 1902.759 | 20.4 | 217.2 | 1.18 | VII | Difficult. |
| 1903.664 | 21.6 | 217.6 | 1.11 | VII | |
| .690 | 18.8 | 212.2 | 1.10 | VI | |
| .721 | 20.3 | 212.1 | 1.07 | VII | |
| 1906.549 | 17.0 | 189.7 | 0.47 | VII | |
| 1897.658 | 3 n | 234.90 | 1.28 | Means. | |
| 1898.654 | 3 n | 230.27 | 1.33 | | |
| 1899.578 | 1 n | 222.00 | 1.24 | | |
| 1901.735 | 3 n | 219.13 | 1.12 | | |
| 1902.759 | 1 n | 217.20 | 1.18 | | |
| 1903.692 | 3 n | 213.97 | 1.09 | | |
| 1906.549 | 1 n | 189.70 | 0.47 | | |

 Σ 2434, A B.

R. A., 18h 57m.6

Dec., $-0^{\circ} 51'$

| | | | | | |
|----------|------|-------|-------|---|-------|
| 1902.664 | 20.7 | 124.1 | 23.57 | V | Good. |
|----------|------|-------|-------|---|-------|

 Σ 2434, B C.

R. A., 18h 57m.6

Dec., $-0^{\circ} 51'$

| | | | | | |
|----------|------|-------|------|--------|------------|
| 1902.664 | 20.6 | 50.9 | 1.14 | VI | Difficult. |
| .745 | 20.8 | 54.4 | 1.23 | VI | Difficult. |
| 1906.587 | 18.5 | 50.6 | 1.17 | VI | |
| .611 | 18.0 | 53.5 | 1.34 | VI | |
| 1902.704 | 2 n | 52.65 | 1.18 | Means. | |
| 1906.599 | 2 n | 52.05 | 1.25 | | |

| Date. | Sid. T. | p | s | Eyepiece. | Remarks. |
|-------|---------|------------|-----|-----------|----------|
| | h | $^{\circ}$ | $'$ | | |

 Σ 2455R. A., 19^h 2^m.6

Dec., +22° 0'

| | | | | | |
|----------|-------|-------|------|--------|---------------|
| 1896.876 | 23.3 | 82.2 | 3.36 | IV | Very blurred. |
| 1897.636 | 19.7 | 82.8 | 3.62 | IV | Good. |
| .644 | 19.9 | 82.0 | 3.73 | III | |
| 1898.613 | 18.3 | 80.4 | 3.45 | IV | Good. |
| .736 | 22.9 | 80.5 | 3.18 | III | Very blurred. |
| .739 | 20.7 | 81.6 | 3.38 | III | Good. |
| 1899.564 | 19.1 | 79.3 | 3.58 | VII | |
| .578 | 16.9 | 78.1 | 3.44 | V | |
| .594 | 16.8 | 79.6 | 3.59 | V | |
| 1901.698 | 19.4 | 78.4 | 3.56 | VI | |
| .737 | 19.2 | 79.0 | 3.46 | VII | |
| 1896.876 | 1 n | 82.20 | 3.36 | Means. | |
| 1897.640 | 2 n | 82.40 | 3.68 | | |
| 1898.696 | 3 n | 80.83 | 3.34 | | |
| 1899.579 | 3 n | 79.00 | 3.54 | | |
| 1901.718 | 2 n | 78.70 | 3.51 | | |
| 1906.611 | 3 n | 71.73 | 3.76 | | |

 Σ 2525R. A., 19^h 22^m.5

Dec., +27° 7'

| | | | | | |
|----------|------|-------|------|----|------------------------|
| 1897.636 | 20.0 | 320.9 | 0.42 | IV | Separated. |
| .644 | 21.1 | 320.9 | 0.42 | IV | Separated by glimpses. |
| .652 | 19.8 | 322.9 | 0.50 | IV | Separated. |
| 1898.613 | 18.6 | 321.6 | 0.45 | IV | |
| .739 | 21.3 | 319.8 | 0.49 | IV | Blurred. |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece. | Remarks. |
|-------|----------|----------|----------|-----------|----------|
| | <i>h</i> | <i>o</i> | <i>°</i> | | |

Σ 2525—Continued.

| | | | | | |
|----------|------------|--------|------|--------|-----------------|
| 1901.698 | 19.8 | 321.8 | 0.60 | VII | |
| .725 | 20.2 | 316.2 | 0.62 | VII | Good. |
| .737 | 19.4 | 323.0 | 0.55 | VII | |
| 1902.759 | 20.6 | 139.7 | 0.54 | VII | Well separated. |
| 1903.557 | 19.2 | 317.3 | 0.70 | VII | |
| .690 | 19.6 | 320.6 | 0.69 | VI | |
| .712 | 19.2 | 319.0 | 0.58 | VIII | Good. |
| 1906.587 | 18.7 | 317.3 | 0.74 | VI | |
| .606 | 17.8 | 314.7 | 0.49 | VII | Difficult. |
| .617 | 17.7 | 316.5 | 0.48 | VII | Good. |
| 1897.644 | 3 <i>n</i> | 321.63 | 0.45 | Means. | |
| 1898.676 | 2 <i>n</i> | 320.70 | 0.47 | | |
| 1901.720 | 3 <i>n</i> | 320.33 | 0.59 | | |
| 1902.759 | 1 <i>n</i> | 319.70 | 0.54 | | |
| 1903.653 | 3 <i>n</i> | 318.97 | 0.66 | | |
| 1906.603 | 3 <i>n</i> | 316.17 | 0.57 | | |

β 827

R. A., 19^h 37^m.8

Dec., -11° 19'

| | | | | | |
|----------|------------|--------|------|-------|----------|
| 1902.664 | 20.9 | 265.6 | 0.88 | VI | |
| .759 | 20.8 | 262.2 | 0.81 | III | |
| .794 | 21.6 | 271.0 | 0.69 | VI | Blurred. |
| 1902.706 | 3 <i>n</i> | 266.27 | 0.79 | Mean. | |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece. | Remarks. |
|-------|---------|----------|----------|-----------|----------|
| | h | ° | ' | | |

S. D.—11°, 5108

R. A., 19^h 38^m.1

Dec., —11° 28'

| | | | | | |
|----------|------|--------|------|-------|--|
| 1902.745 | 21.0 | 246.7 | 1.37 | V | |
| .759 | 21.2 | 247.4 | 1.31 | III | |
| .794 | 21.3 | 246.9 | 1.48 | VI | |
| 1902.766 | 3 n | 247.00 | 1.39 | Mean. | |

OZ 387

R. A., 19^h 46^m.0

Dec., +35° 4'

| | | | | | |
|----------|------|-------|------|------|-------|
| 1897.644 | 20.5 | 346.6 | 0.62 | IV | Good. |
| .652 | 20.7 | 344.0 | 0.63 | IV | |
| .660 | 20.6 | 344.3 | 0.60 | IV | |
| 1898.613 | 18.9 | 340.9 | 0.57 | IV | |
| 1901.725 | 20.5 | 336.8 | 0.62 | VII | |
| .737 | 19.7 | 339.8 | 0.58 | VII | |
| .743 | 20.1 | 340.1 | 0.52 | VII | |
| 1902.759 | 21.4 | 337.0 | 0.66 | III | |
| 1903.557 | 19.4 | 339.1 | 0.68 | VII | |
| .674 | 18.8 | 332.1 | 0.60 | VI | |
| 1904.822 | 21.9 | 330.1 | 0.59 | VIII | |
| .825 | 22.2 | 329.1 | 0.63 | VI | |
| .833 | 22.9 | 331.3 | 0.61 | VII | |
| 1906.587 | 18.9 | 329.6 | 0.67 | VIII | |
| .606 | 17.7 | 329.0 | 0.55 | VII | |
| .617 | 17.9 | 329.9 | 0.54 | VII | |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece. | Remarks. |
|-------|---------|----------|----------|------------|----------|
| | h | o | " | | |

O Σ 387—Continued.

| | | | | | |
|----------|------------|--------|------|--------|--|
| 1897.652 | 3 <i>n</i> | 344.97 | 0.62 | Means. | |
| 1898.613 | 1 <i>n</i> | 340.90 | 0.57 | | |
| 1901.735 | 3 <i>n</i> | 338.90 | 0.57 | | |
| 1902.759 | 1 <i>n</i> | 337.00 | 0.66 | | |
| 1903.616 | 2 <i>n</i> | 335.60 | 0.64 | | |
| 1904.827 | 3 <i>n</i> | 330.17 | 0.61 | | |
| 1906.603 | 3 <i>n</i> | 329.50 | 0.59 | | |

W. H. I. 93

R. A., 19^h 56^m.4

Dec., -0° 32'

| | | | | | |
|----------|------|-------|------|----|--|
| 1902.642 | 21.3 | 293.5 | 2.02 | VI | |
|----------|------|-------|------|----|--|

O Σ 395R. A., 19^h 57^m.8

Dec., +24° 40'

| | | | | | |
|----------|------------|--------|------|--------|---------------|
| 1902.759 | 21.7 | 96.5 | 0.69 | VI | Very blurred. |
| 1903.557 | 19.6 | 101.5 | 0.68 | VII | |
| .674 | 19.2 | 99.6 | 0.69 | VII | Blurred. |
| 1904.822 | 22.2 | 101.5 | 0.70 | VII | |
| .825 | 22.4 | 100.7 | 0.75 | VII | Blurred. |
| 1906.587 | 19.2 | 104.8 | 0.64 | VIII | |
| .606 | 18.1 | 106.1 | 0.60 | VIII | |
| .617 | 17.6 | 105.2 | 0.59 | VII | |
| 1902.759 | 1 <i>n</i> | 96.50 | 0.69 | Means. | |
| 1903.616 | 2 <i>n</i> | 100.55 | 0.68 | | |
| 1904.824 | 2 <i>n</i> | 101.10 | 0.72 | | |
| 1906.603 | 3 <i>n</i> | 105.37 | 0.61 | | |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece. | Remarks |
|-------|----------|----------|----------|------------|---------|
| | <i>h</i> | <i>o</i> | <i>'</i> | | |

OΞ 400

R. A., 20^h 6^m.9

Dec., +43° 39'

| | | | | | |
|----------|------------|-------|------------------|--------|----------------------------|
| 1897.660 | 21.6 | ..... | ..... | .... | Doubtful elongation in 75° |
| 1898.613 | 18.7 | ..... | ..... | .... | Single. |
| 1901.725 | 20.7 | 19.3 | 0.25 <i>est.</i> | VII | Very slight elongation. |
| 1902.896 | 23.9 | 27.0 | 0.40 <i>est.</i> | VII | Elongated. |
| 1904.822 | 22.2 | 3.8 | 0.25 <i>est.</i> | VII | Elongated. |
| .841 | 22.8 | 358.5 | 0.49 | VII | Notched. |
| 1906.513 | 18.0 | 180.6 | 0.30 <i>est.</i> | VI | Elongated. |
| .611 | 18.2 | 179.2 | 0.25 <i>est.</i> | VII | Elongated. |
| .617 | 18.1 | 182.1 | 0.25 <i>est.</i> | VII | Elongated. |
| 1901.725 | 1 <i>n</i> | 19.30 | 0.25 | Means. | |
| 1902.896 | 1 <i>n</i> | 27.00 | 0.40 | | |
| 1904.832 | 2 <i>n</i> | 1.15 | 0.37 | | |
| 1906.580 | 3 <i>n</i> | 0.63 | 0.27 | | |

β 1136

R. A., 20^h 29^m.3

Dec., +49° 16'

| | | | | | |
|----------|------|-------|-------|------|----------------------------|
| 1906.611 | 18.3 | | | | Suspect elongation in 220° |
|----------|------|-------|-------|------|----------------------------|

Σ 2704. β DELPHINI

R. A., 20^h 32^m.9

Dec., +14° 15'

| | | | | | |
|----------|------|-------|------|----|----------|
| 1897.644 | 20.9 | 358.7 | 0.60 | IV | Blurred. |
| .660 | 21.1 | 359.9 | 0.57 | IV | |
| .671 | 20.4 | 358.0 | 0.48 | IV | |
| .717 | 20.1 | 357.5 | 0.63 | IV | |

13 OBS.

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece. | Remarks. |
|-------|---------|----------|----------|------------|----------|
| | h | o | ' | | |

 β DELPHINI—Continued.

| | | | | | |
|----------|------|--------|------------------|--------|-------------------------|
| 1901.725 | 21.0 | 12.2 | 0.46 | VII | |
| .754 | 19.8 | 10.5 | 0.56 | VII | Very blurred. |
| .759 | 20.0 | 11.5 | 0.46 | VII | Blurred. |
| .761 | 19.8 | 11.0 | 0.51 | VII | |
| 1902.653 | 21.0 | 18.2 | 0.30 <i>est.</i> | VI | Wedge. |
| 1903.557 | 19.7 | 28.2 | 0.47 | VIII | Notched. |
| .712 | 19.5 | 23.6 | 0.35 | VIII | Not separated, |
| 1904.841 | 23.2 | 58.7 | .... | VII | Very slight elongation. |
| 1906.587 | 19.3 | .... | .... | .... | Elongated in 90°. |
| 1897.673 | 4 n | 358.52 | 0.57 | Means. | |
| 1901.750 | 4 n | 11.30 | 0.50 | | |
| 1902.653 | 1 n | 18.20 | 0.30 | | |
| 1903.634 | 2 n | 25.90 | 0.41 | | |
| 1904.841 | 1 n | 58.7 | .... |  |  |

 α 413, λ CYGNIR, A., 20^h 43^m.5

Dec., +36° 7'

| | | | | | |
|----------|------|------|------|-----|---------------|
| 1897.717 | 19.2 | 69.2 | 0.75 | IV | Blurred. |
| .826 | 22.4 | 63.9 | 0.62 | IV | Very blurred. |
| .835 | 22.5 | 62.8 | 0.62 | IV | Good. |
| 1898.613 | 19.1 | 71.5 | 0.66 | IV | |
| 1899.578 | 17.3 | 73.7 | 0.70 | VII | |
| .594 | 17.1 | 71.9 | 0.54 | VII | |
| 1901.737 | 20.0 | 66.1 | 0.63 | VII | |
| .743 | 20.3 | 66.3 | 0.72 | VII | |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece. | Remarks. |
|-------|---------|----------|----------|------------|----------|
| | h | o | . | | |

OΞ 413, λ CYGNI—Continued.

| | | | | | |
|----------|------|-------|-----------------|--------|---------------|
| 1902.653 | 21.5 | 63.2 | 0.91 | VI | |
| .786 | 23.6 | 60.1 | 0.8 <i>est.</i> | VII | |
| .896 | 23.7 | 61.8 | 0.55 | VII | Very blurred. |
| 1903.667 | 19.2 | 67.0 | 0.77 | VI | Very blurred. |
| .690 | 19.9 | 63.2 | 0.84 | VI | |
| .712 | 19.7 | 67.9 | 0.75 | VII | |
| 1904.786 | 22.0 | 61.8 | 0.69 | VI | Blurred. |
| .792 | 21.9 | 59.1 | 0.65 | VII | Very blurred. |
| .822 | 22.4 | 62.1 | 0.71 | VII | Very blurred. |
| 1906.587 | 19.4 | 66.0 | 0.72 | VIII | |
| .611 | 18.5 | 66.5 | 0.73 | VII | Blurred. |
| .617 | 18.3 | 66.6 | 0.63 | VII | Bad seeing. |
| 1897.793 | 3 n | 65.30 | 0.66 | Means. | |
| 1898.613 | 1 n | 71.50 | 0.66 | | |
| 1899.580 | 2 n | 72.80 | 0.62 | | |
| 1901.740 | 2 n | 66.20 | 0.68 | | |
| 1902.738 | 3 n | 61.70 | 0.75 | | |
| 1903.690 | 3 n | 66.03 | 0.79 | | |
| 1904.800 | 3 n | 61.00 | 0.68 | | |
| 1906.605 | 3 n | 66.37 | 0.69 | | |

Σ 2729. 4 AQUARI

R. A., 20h 46m.2

Dec., -6° 1'

| | | | | | |
|----------|------|-------|------------------|-----|-------------------------|
| 1897.660 | 20.8 | 196.3 | 0.25 <i>est.</i> | IV | Elongated. |
| 1901.725 | 21.1 | 238.5 | 0.25 <i>est.</i> | VII | Very slight elongation. |
| 1902.748 | 22.4 | 246.5 | 0.25 <i>est.</i> | VII | Elongated. |
| 1903.557 | 20.0 | ..... | .... | VII | Cannot. |

OBSERVATIONS OF DOUBLE STARS.

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece. | Remarks. |
|-------|----------|----------|----------|-----------|----------|
| | <i>h</i> | <i>o</i> | <i>u</i> | | |

 β 680

R. A., 21h 3m.1

Dec., +53° 20'

| | | | | | |
|----------|------------|--------|------|--------|-------|
| 1904.841 | 23.5 | 304.1 | 0.61 | VII | Good. |
| 1906.587 | 19.8 | 304.9 | 0.60 | VIII | |
| .617 | 18.8 | 302.0 | 0.60 | VII | |
| .649 | 18.3 | 308.0 | 0.47 | VII | |
| 1904.841 | 1 <i>n</i> | 304.10 | 0.61 | Means. | |
| 1906.618 | 3 <i>n</i> | 304.97 | 0.56 | | |

 Σ 2777. δ EQUULEI

R. A., 21h 9m.6

Dec., +9° 36'

| | | | | | |
|----------|------|------|------------------|------|-------------------------|
| 1896.818 | 22.0 | .... | .... | .... | Single. |
| 1897.600 | 21.4 | 32.1 | 0.35 <i>est.</i> | IV | Notched. |
| .671 | 20.6 | 17.5 | 0.35 <i>est.</i> | IV | Elongated. |
| 1901.725 | 21.2 | .... | .... | VII | Single. |
| 1902.748 | 22.5 | 45.1 | 0.20 <i>est.</i> | VII | Very slight elongation. |
| 1903.712 | 19.9 | 16.9 | 0.30 <i>est.</i> | VIII | Elongated. |

 τ CYGNI

R. A., 21h 10m.8

Dec., +37° 37'

| | | | | | |
|----------|------|-------|------|-----|---------------|
| 1897.717 | 19.5 | 322.6 | 0.93 | IV | Very blurred. |
| .728 | 20.1 | 326.6 | 0.95 | IV | Good. |
| .835 | 22.6 | 321.7 | 0.79 | IV | Good. |
| 1898.613 | 19.3 | 318.2 | .... | IV | Very blurred. |
| 1901.725 | 21.7 | 295.2 | 0.80 | VII | |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece. | Remarks. |
|-------|----------|----------|----------|-----------|----------|
| | <i>h</i> | <i>o</i> | <i>'</i> | | |

 τ CYGNI—Continued.

| | | | | | |
|----------|------------|--------|------|--------|----------|
| 1901.759 | 20.4 | 299.6 | 0.65 | VII | Blurred. |
| .761 | 20.1 | 294.3 | 0.77 | VII | Blurred. |
| 1904.841 | 23.7 | 270.9 | 0.66 | VIII | |
| 1897.760 | 3 <i>n</i> | 323.63 | 0.88 | Means. | |
| 1898.613 | 1 <i>n</i> | 318.20 | .... |  |  |
| 1901.747 | 3 <i>n</i> | 296.37 | 0.74 | | |
| 1904.841 | 1 <i>n</i> | 270.90 | 0.66 | | |

 Σ 2801R. A., 21^h 21^m.5

Dec., +79° 55'

| | | | | | |
|----------|------------|--------|------|--------|----------|
| 1897.772 | 20.2 | 273.0 | 1.81 | IV | Blurred. |
| 1902.702 | 20.8 | 272.1 | 1.71 | V | |
| 1904.822 | 22.7 | 271.2 | 1.70 | V | |
| .844 | 23.0 | 274.1 | 1.92 | III | |
| 1897.772 | 1 <i>n</i> | 273.00 | 1.81 | Means. | |
| 1902.702 | 1 <i>n</i> | 272.10 | 1.71 | | |
| 1904.833 | 2 <i>n</i> | 272.65 | 1.81 | | |

 β 1212. 24 AQUARIR. A., 21^h 34^m.3

Dec., -0° 31'

| | | | | | |
|----------|------|-------|------|-----|--|
| 1902.748 | 22.7 | 270.4 | 0.46 | VII | |
| 1903.557 | 20.0 | 269.1 | 0.50 | VII | |
| 1904.822 | 21.5 | 273.0 | 0.47 | VII | |
| .825 | 22.6 | 276.2 | 0.47 | VII | |
| 1906.751 | 20.7 | 276.4 | 0.50 | VII | |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece. | Remarks. |
|-------|----------|----------|----------|-----------|----------|
| | <i>h</i> | <i>o</i> | <i>r</i> | | |

24 AQUARI—Continued.

| | | | | | |
|----------|------------|--------|------|--------|--|
| 1902.748 | 1 <i>n</i> | 270.40 | 0.46 | Means. | |
| 1903.557 | 1 <i>n</i> | 269.10 | 0.50 | | |
| 1904.824 | 2 <i>n</i> | 274.60 | 0.47 | | |
| 1906.751 | 1 <i>n</i> | 276.40 | 0.50 | | |

 β 989. κ PEGASIR. A., 21^h 40^m.6

Dec., +25° 13'

| | | | | | |
|----------|------|-------|------|------|----------------------|
| 1897.728 | 20.3 | ..... | .... | IV | Round. |
| .835 | 22.8 | ..... | .... | IV | Round. |
| 1901.725 | 22.0 | ..... | .... | VII | Single. |
| 1902.748 | 22.9 | ..... | .... | VII | Cannot. |
| 1904.841 | 23.8 | 122.0 | 0.20 | VIII | Elongated. Axes 2:3. |

 β 693R. A., 21^h 51^m.0

Dec., -7° 27'

| | | | | | |
|----------|------|------|------|----|-------|
| 1896.818 | 22.3 | 54.1 | 1.11 | IV | Good. |
|----------|------|------|------|----|-------|

 β 172. 51 AQUARIR. A., 22^h 18^m9.

Dec., -5° 21'

| | | | | | |
|----------|------|-------|------|-----|--|
| 1896.818 | 22.4 | 7.0 | 0.67 | IV | |
| 1906.751 | 21.0 | 359.5 | 0.64 | VII | |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece. | Remarks. |
|-------|----------|----------|----------|-----------|----------|
| | <i>h</i> | <i>o</i> | <i>o</i> | | |

Σ 2912, 37 PEGASI

R. A., 22h 24m.9

Dec., +3° 55'

| | | | | | |
|----------|------|-------|------------------|------|------------|
| 1897.835 | 22.9 | 286.5 | 0.25 <i>est.</i> | IV | Elongated. |
| 1901.725 | 22.2 | 302.9 | 0.30 <i>est.</i> | VII | Elongated. |
| 1902.748 | 23.0 | 313.5 | 0.35 <i>est.</i> | VII | |
| 1904.841 | 0.0 | 293.9 | 0.39 | VIII | Blurred. |

Σ 2924

R. A., 22h 30m.1

Dec., +69° 24'

| | | | | | |
|----------|------|-------|------|-----|--|
| 1897.772 | 20.0 | 268.4 | 0.65 | IV | |
| 1906.649 | 18.1 | 276.2 | 0.52 | VII | |

OΣ 477

R. A., 22h 39m.1

Dec., +45° 30'

| | | | | | |
|----------|------|-------|------|---|------------|
| 1906.617 | 18.6 | 209.0 | 4.99 | V | Difficult. |
| .649 | 17.8 | 207.4 | 4.51 | V | |

OΣ 481

R. A., 22h 42m.3

Dec., +78° 0'

| | | | | | |
|----------|------|-------|------|-----|-----------------|
| 1897.772 | 20.5 | 271.2 | 2.50 | III | |
| 1901.833 | 22.2 | 270.3 | 2.15 | VII | Blurred. |
| .836 | 22.4 | 267.6 | 2.50 | III | Bad seeing. |
| .866 | 1.3 | 268.4 | 2.38 | III | |
| .871 | 23.4 | 267.0 | 2.39 | III | |
| 1902.702 | 21.1 | 267.5 | 2.31 | V | Through clouds. |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece. | Remarks. |
|-------|---------|----------|----------|------------|----------|
| | h | o | ' | | |

O Σ 481—Continued.

| | | | | | |
|----------|------------|--------|------|--------|--|
| 1903.667 | 20.8 | 270.4 | 2.55 | III | |
| .674 | 19.8 | 268.4 | 2.57 | X | |
| 1904.822 | 22.9 | 264.2 | 2.21 | V | |
| .844 | 22.9 | 265.3 | 2.37 | III | |
| 1897.772 | 1 <i>n</i> | 271.20 | 2.50 | Means. | |
| 1901.852 | 4 <i>n</i> | 268.32 | 2.36 | | |
| 1902.702 | 1 <i>n</i> | 267.50 | 2.31 | | |
| 1903.670 | 2 <i>n</i> | 269.40 | 2.58 | | |
| 1904.833 | 2 <i>n</i> | 264.75 | 2.29 | | |

O Σ 536R. A., 22^h 53^m.5

Dec., +8° 50'

| | | | | | |
|----------|------------|--------|------------------|--------|-------------------------|
| 1897.728 | 20.5 | 166.2 | 0.35 <i>est.</i> | IV | Blurred and difficult. |
| .835 | 23.0 | 167.5 | 0.25 <i>est.</i> | IV | Elongated. |
| 1901.725 | 22.3 | 163.5 | 0.25 <i>est.</i> | VII | Elongated. |
| .761 | 20.4 | 161.3 | 0.35 <i>est.</i> | VII | Very blurred. Doubtful. |
| 1904.841 | 0.2 | 154.6 | 0.27 | VIII | Notched. |
| 1897.782 | 2 <i>n</i> | 166.85 | 0.30 | Means. | |
| 1901.743 | 2 <i>n</i> | 162.40 | 0.30 | | |
| 1904.841 | 1 <i>n</i> | 154.60 | 0.27 | | |

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece. | Remarks. |
|-------|----------|----------|----------|-----------|----------|
| | <i>h</i> | <i>o</i> | <i>r</i> | | |

OZ 483, 52 PEGASI

R. A., 22^h 54^m.2

Dec., +11° 12'

| | | | | | |
|----------|------|--------|------|--------|---------------|
| 1896.818 | 23.9 | 221.9 | 1.16 | IV | Good. |
| 1897.728 | 20.7 | 219.5 | 0.98 | IV | |
| .835 | 23.2 | 222.7 | 0.96 | IV | |
| 1901.725 | 22.4 | 221.2 | 0.93 | VII | |
| .743 | 20.7 | 220.9 | 0.81 | VII | |
| .759 | 20.9 | 219.9 | 0.84 | VII | Very blurred. |
| .868 | 22.9 | 221.4 | 0.62 | VII | |
| 1902.786 | 23.3 | 222.2 | 0.99 | VI | |
| 1903.674 | 18.9 | 218.4 | 0.92 | VI | |
| 1904.822 | 23.8 | 223.3 | 1.19 | VI | |
| .825 | 22.8 | 221.8 | 0.99 | VII | Poor seeing. |
| .841 | 0.4 | 221.9 | 1.05 | VI | |
| 1906.751 | 21.4 | 223.7 | 0.79 | VII | |
| 1897.460 | 3 " | 221.37 | 1.03 | Means. | |
| 1901.774 | 4 " | 220.85 | 0.80 | | |
| 1903.230 | 2 " | 220.30 | 0.96 | | |
| 1904.829 | 3 " | 222.33 | 1.08 | | |
| 1906.751 | 1 " | 223.70 | 0.79 | | |

OZ 489, π CEPHEIR. A., 23^h 4^m.7

Dec., +74° 51'

| | | | | | |
|----------|------|------|------|-----|---------------|
| 1897.722 | 19.7 | 43.0 | 1.04 | IV | Very blurred. |
| 1899.600 | 16.8 | 42.0 | 0.80 | VII | |
| 1901.759 | 21.2 | 48.9 | 1.03 | VII | Blurred. |
| .871 | 23.2 | 45.5 | 0.71 | VII | Poor. |

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OBSERVATIONS OF DOUBLE STARS.

| Date. | Sid. T. | p | s | Eyepiece. | Remarks. |
|-------|---------|-----|-----|-----------|----------|
| | h | ° | ' | | |

 β 80R. A., 23^h 13^m.7

Dec., +4° 51'

| | | | | | |
|----------|------|-------|------------------|-----|--|
| 1897.835 | 23.3 | 341.4 | 0.53 | IV | |
| 1901.725 | 22.7 | 5.9 | 0.25 <i>est.</i> | VII | |

 α 507R. A., 23^h 43^m.8

Dec., +64° 19'

| | | | | | |
|----------|------|--------|------|--------|---------------|
| 1901.833 | 22.6 | 265.5 | 0.66 | III | Very blurred. |
| .866 | 1.6 | 263.6 | 0.66 | VII | |
| 1906.649 | 18.5 | 271.2 | 0.47 | VII | |
| 1901.850 | 2 n | 264.55 | 0.66 | Means. | |
| 1906.649 | 1 n | 271.20 | 0.47 | | |

 β 733, 85 PEGASIR. A., 23^h 56^m.9

Dec., +26° 33'

| | | | | | |
|----------|------|------|------|------|---------------------------|
| 1897.835 | | | | | Cannot see <i>comes</i> . |
|----------|------|------|------|------|---------------------------|

58337
Ack.

PUBLICATIONS

OF THE

WASHBURN OBSERVATORY

OF THE

UNIVERSITY OF WISCONSIN

VOL. X. PART 4

OBSERVATIONS OF DOUBLE STARS
1907-1919

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The Homestead Co.,
Des Moines, Iowa

The Washburn Observatory

FOUNDED BY

Cadwallader C. Washburn

Born 1818 Died 1882

INTRODUCTION

The following observations of double stars are the completion of a series whose earlier results (1892-1906) are to be found in Parts 1 and 3, Vol. X of the Publications of the Washburn Observatory. It was contemplated at the beginning of the series that it should be as nearly as possible homogeneous in character throughout the entire extent and the plan then formed has been adhered to with very little modification. Reference may therefore be made to the Vol. X above cited for an account of the instrument and the methods of observation.

The micrometer has continued to give good service although superficially it appears somewhat worn. I have found no reason to modify the value of a revolution of the screw or the practice with respect to its periodic and progressive errors set forth in the Introduction to Part 3, Vol. X of these Publications. Observations have generally been made with bright threads illuminated from an electric lamp shining through a red glass screen. An exception to this practice occurs in observations made in the twilight when the unilluminated threads were seen black against a bright back ground.

Some change of eye-pieces has been produced by loss and breakage and I therefore give below a complete list of the oculars that have been employed in this work between 1892 and 1920.

TABLE OF OCULARS

| Designation | Type | Maker | Power | Field |
|-------------|---------|---------------|-------|-------|
| I | Ramsden | Clark | 196 | 11.6 |
| II | Ramsden | Clark | 284 | 8.6 |
| III | Ramsden | Clark | 439 | 5.6 |
| IV | Ramsden | Clark | 792 | 3.6 |
| V | Kellner | Kahler | 325 | 7.7 |
| VI | " | " | 537 | 5.1 |
| VII | " | " | 716 | 3.4 |
| VIII | " | " | 850 | 2.9 |
| IX | " | " | 1540 | 0.8 |
| X | Ramsden | Bausch & Lomb | 288 | 10.8 |
| 7 | Kellner | Zeiss | 890 | 3.1 |
| 9 | " | " | 667 | 3.9 |
| 12 | " | " | 495 | 5.4 |
| 30 | " | " | 205 | 13.3 |

I have very rarely found it possible to use as high a magnifying power as the 1540 diameters above attributed to Ocular IX, but a large part of the observations have been made with Oculars IV, VIII and 7, i.e. with magnifying powers of about twenty times the objective aperture in centimeters.

All the observations here considered have been made by the writer of these lines and as they cover a period of many years it is quite possible that the lapse of time has produced changes in the nature of personal error, but no definite evidence of such change is at hand save what may inhere in the observations themselves. The internal consistency of the observations is of interest in this connection and I therefore reproduce from Vol. X the determinations of probable error of a single observation there given and supplement them by similar results obtained from subsequent data. Each number here printed depends upon not less than 100 residuals and in the collection of these residuals no observation has been rejected as abnormal. There seems to be no indication of substantial change in the measure of precision attained in the several periods of observation.

For comparison's sake I append to the above exhibit a brief compilation of similar probable errors as published by other observers. The arrangement follows the order of increasing size of the objective employed.

P. E. of a Single Observation by C.

| Period | $s < 0.5$ | | $0.5 - 1.0$ | | $1.0 - 2.0$ | | $2.0 - 4.0$ | | $s > 4.0$ | |
|-----------|-----------|------------|-------------|------------|-------------|------------|-------------|------------|-----------|------------|
| 1893-1896 | ± 2.3 | ± 0.03 | ± 1.4 | ± 0.05 | ± 1.1 | ± 0.06 | ± 0.9 | ± 0.07 | ± 0.8 | ± 0.09 |
| 1897-1903 | 2.9 | .03 | 1.3 | .05 | 1.0 | .07 | 0.9 | .06 | 0.8 | .07 |
| 1912-1918 | 2.6 | .03 | 1.3 | .05 | 1.0 | .09 | 1.0 | .09 | 0.9 | .10 |

P. E. of a Single Observation by Sundry Observers

| Observer | $s < 0.5$ | | $0.5 - 1.0$ | | $1.0 - 2.0$ | | $2.0 - 4.0$ | | $s > 4.0$ | |
|------------|-----------|------------|-------------|------------|-------------|------------|-------------|------------|-----------|------------|
| Δ | | | ± 2.5 | ± 0.07 | ± 1.4 | ± 0.08 | ± 0.9 | ± 0.09 | ± 0.7 | ± 0.10 |
| Sp. | ± 3.1 | ± 0.04 | 1.6 | .05 | 1.1 | .07 | 0.7 | .09 | 0.6 | .10 |
| Σ | ..... |  | 2.5 | .08 | 2.0 | .10 | 1.4 | .12 | 1.1 | .15 |
| O Σ | ..... |  | 2.3 | .04 | 2.0 | .08 | 1.4 | .08 | 1.0 | .09 |
| C | 2.6 | .03 | 1.3 | .05 | 1.0 | .07 | 0.9 | .07 | 0.8 | .09 |
| Hall | ..... |  | 2.7 | .03 | 1.9 | .05 | 0.9 | .05 | 0.5 | .05 |
| H Σ | ..... |  | 1.1 | .05 | 1.2 | .08 | 0.9 | .07 | 0.5 | .06 |
| Ait. | 1.4 | .02 | ..... |  | ..... |  | 1.0 | .07 | ..... |  |

The foregoing table seems to justify the common belief that the weight to be assigned to a double star observation is not at all closely related to the size of the telescope with which it was made.

In general I have estimated the magnitudes of the stars observed whenever they were sufficiently separated to permit this to be done, but the interest of these observations relates to the observer and his impressions of what he saw rather than to the intrinsic brightness of the stars themselves. I give therefore, in italics, following the co-ordinates of the stars, only the mean result of these estimates for each pair. For magnitudes brighter than 8.5 there is included in this mean a correction of

—0.1 m and for magnitudes fainter than 9.5 a correction of +0.1 m to reduce the estimates to the scale of the Revised Harvard Photometry (Annals Vol. 50). These corrections are taken from an unpublished discussion of more abundant material contained in my observations of proper motion stars. As a partial control upon these values I have compared my corrected estimates with the Magnitudes of Double Stars contained in Vol. 64 of the Harvard Annals. Only 15 pairs, 30 stars, are available for this comparison, three-fourths of which are brighter than the seventh magnitude. Their mean result, which I ignore, is that in the mean a further correction of +0.3m is required to secure agreement between the printed numbers and the Harvard scale. A by-product of this comparison is that the probable error of a single corrected estimate of magnitude is on the average $\pm 0.3m$.

The form of publication adopted seems to call for little explanation beyond the statement that the number following the name of each star is that assigned to it in Burnham's General Catalogue. For ready reference and comparison there is included in the mean results following each pair a reproduction of the means of previous observations by myself hitherto printed in Vol. X. These mean results are therefore a complete exhibit of my observations of the stars in question but numerous observations of stars not included in the present list are not thus reproduced. The coordinates of the stars are referred to the epoch 1900. 0.

January, 1921.

OBSERVATIONS OF DOUBLE STARS

| Date. | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece | Remarks |
|---|------------|----------|----------|----------|------------------|
| | <i>h</i> | <i>°</i> | <i>'</i> | | |
| Σ 3062, 12755 $0^h 1.1^m$ $+57^\circ 53'$ 6.1 7.7 | | | | | |
| 1908.751 | 22.4 | 359.8 | 1.96 | VII | Bad seeing |
| .759 | 21.3 | 355.4 | 1.67 | VII | |
| 1912.620 | 21.3 | 3.3 | 1.59 | VI | Good |
| 1915.825 | 22.9 | 9.3 | 1.59 | 12 | Good |
| .926 | 2.7 | 7.5 | 1.78 | 7 | |
| .951 | 1.3 | 7.4 | 1.40 | 12 | |
| 1916.598 | 18.7 | 10.7 | 1.57 | 7 | |
| .606 | 18.3 | 10.8 | 1.62 | 9 | |
| .645 | 20.5 | 11.1 | 1.67 | 9 | |
| 1917.015 | 2.9 | 9.3 | 1.16 | 12 | |
| .628 | 20.6 | 12.6 | 1.24 | 12 | |
| .659 | 20.1 | 12.3 | 1.76 | 9 | |
| .661 | 20.1 | 11.3 | 1.16 | 12 | Very bad. |
| .674 | 20.2 | 11.3 | 1.64 | 7 | Blurred. |
| .737 | 20.3 | 12.1 | 1.49 | 7 | Very bad seeing. |
| 1919.732 | 21.5 | 15.2 | 1.60 | 7 | |
| 1892.79 | 3 <i>n</i> | 329.13 | 1.47 | | |
| 1893.83 | 2 | 327.85 | 1.58 | | |
| 1895.60 | 6 | 333.47 | 1.57 | | |
| 1897.34 | 2 | 335.65 | 1.54 | | |
| 1901.85 | 2 | 344.40 | 1.56 | | |
| 1907.89 | 3 | 354.53 | 1.59 | | |
| 1912.62 | 1 | 3.30 | 1.59 | | |
| 1915.90 | 3 | 8.07 | 1.59 | | |
| 1916.72 | 4 | 10.47 | 1.51 | | |
| 1917.67 | 5 | 11.92 | 1.46 | | |
| 1919.73 | 1 | 15.20 | 1.60 | | |

OBSERVATIONS OF DOUBLE STARS

7

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece | Remarks |
|------|----------|----------|----------|-----------|---------|
| | <i>h</i> | <i>°</i> | <i>'</i> | | |

 Σ 2, 21 $0^h 3.8^m$ $+79^\circ 9'$

6.2 ...

| | | | | | |
|----------|------------|--------|------------------|---------------------------|-------------------|
| 1908.759 | 21.5 | ..... | Suspect | elongation in 160° | |
| 1912.620 | 21.3 | 117.2 | 0.25 <i>est.</i> | VII | Slight elongation |
| 1916.598 | 18.5 | 131.1 | 0.25 <i>est.</i> | 7 | Elongated? |
| 1917.721 | 21.7 | 107.5 | 0.30 <i>est.</i> | 7 | Elongated. |
| 1893.94 | 2 <i>n</i> | 168.70 | 0.28 | | |
| 1897.72 | 2 | 153.15 | 0.35 | | |
| 1915.65 | 3 | 118.60 | 0.27 | | |

Hn 1, 80

 $0^h 9.3^m$ $+53^\circ 18'$

7.8 11.7

| | | | | | |
|----------|------------|-------|------------------|---------------|---------------------|
| 1914.617 | 21.0 | 7.6 | 2.22 | 12 | Faint and difficult |
| 1916.020 | 3.6 | 7.2 | 1.8 ^m | V | |
| .598 | 19.1 | 11.4 | 1.94 | V | |
| .606 | 18.8 | 9.7 | 2.28 | V | Difficult. |
| 1917.659 | 20.8 | 11.1 | 2.30 | V | |
| .721 | 21.5 | 10.4 | 2.19 | 12 | Faint |
| .839 | 22.2 | 10.3 | 2.10 | V | |
| 1888.57 | 4 <i>n</i> | 6.92 | 2.47 | | |
| 1915.96 | 4-3 | 8.98 | 2.15 | | |
| 1917.74 | 3 | 10.60 | 2.20 | Little change | |

 $O\Sigma$ 4, 104 $0^h 11.5^m$ $+35^\circ 56'$

7.7 8.

| | | | | | |
|----------|------------|--------|---------|---------------------------|--|
| 1908.759 | 22.0 | | Suspect | elongation in 160° | |
| 1894.49 | 3 <i>n</i> | 123.30 | 0.22 | | |
| 1902 | 1 | ? | ? | | |
| 1908 | 1 | ? | ? | | |

| Date | Sid. T. | p | s | Eyepiece | Remarks |
|------|---------|------------|------|----------|---------|
| | h | $^{\circ}$ | $''$ | | |

 Σ 19, 105 $0^h 11.7^m$ $+36^{\circ} 4'$

6.9 9.2

| | | | | | |
|----------|-------|--------|------|-----|-------------------|
| 1908.756 | 22.4 | 134.0 | 2.11 | X | Very slow motion. |
| .759 | 21.9 | 134.3 | 2.22 | VII | |
| 1894.85 | 3 n | 134.40 | 2.19 | | |
| 1902.97 | 3 | 134.40 | 2.22 | | |
| 1908.76 | 2 | 134.15 | 2.16 | | |

 η Cassiopeiae, 426 $0^h 43.0^m$ $+57^{\circ} 17'$

3.6 7.0

| | | | | | |
|----------|-------|--------|------|----|---------------|
| 1908.756 | 22.2 | 238.1 | 5.86 | X | Bad seeing. |
| .759 | 22.2 | 237.4 | 5.79 | X | |
| .839 | 22.5 | 241.3 | 6.10 | X | |
| 1915.928 | 3.0 | 249.7 | 6.92 | 12 | |
| 1916.006 | 2.5 | 254.1 | 6.66 | 12 | |
| .020 | 3.3 | 252.2 | 6.52 | 30 | |
| .606 | 18.5 | 251.8 | 7.03 | 9 | |
| .645 | 20.9 | 254.3 | 7.23 | 9 | |
| .822 | 22.5 | 253.4 | 6.95 | 7 | |
| 1917.015 | 2.7 | 254.3 | 7.05 | V | |
| .659 | 20.5 | 253.4 | 7.02 | 9 | Very blurred. |
| .674 | 20.4 | 256.0 | 7.10 | 7 | |
| .786 | 21.3 | 253.9 | 6.99 | 9 | |
| .836 | 22.3 | 257.0 | 6.97 | 12 | Very blurred. |
| 1919.732 | 21.9 | 258.2 | 7.00 | V | Bad Seeing. |
| 1892.77 | 3 n | 194.10 | 4.92 | | |
| 1893.94 | 2 | 198.80 | 4.88 | | |
| 1895.17 | 3 | 203.77 | 5.01 | | |
| 1895.83 | 3 | 208.07 | 4.82 | | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece | Remarks |
|------|----------|----------|----------|----------|---------|
| | <i>h</i> | <i>o</i> | <i>"</i> | | |

 η Cassiopeiae, 426—Continued

| | | | | | |
|---------|---|--------|------|--|--|
| 1901.84 | 4 | 223.95 | 5.28 | | |
| 1904.87 | 3 | 231.30 | 5.49 | | |
| 1906.35 | 3 | 231.17 | 5.67 | | |
| 1908.74 | 3 | 238.73 | 5.92 | | |
| 1915.98 | 3 | 252.00 | 6.70 | | |
| 1916.77 | 4 | 253.45 | 7.06 | | |
| 1917.74 | 4 | 255.08 | 7.02 | | |
| 1919.73 | 1 | 258.2 | 7.00 | | |

O Σ 20, 66 Piscium, 479O^h 49.3^m

+18° 39'

5.8 7.6

| | | | | | |
|----------|------|--------|------|-----|-------------------------------|
| 1908.751 | 22.6 | 310.0 | 0.61 | VII | Bad seeing. |
| .756 | 22.9 | 314.5 | 0.52 | VII | |
| 1910.748 | 23.5 | 313.2 | 0.60 | VII | |
| 1915.783 | 23.6 | 306.8 | 0.56 | 9 | |
| .821 | 23.4 | 309.5 | 0.52 | 7 | Very blurred Not separated |
| 1917.012 | 2.2 | 293.4 | 0.44 | 7 | |
| .721 | 22.9 | 305.8 | 0.48 | 7 | |
| .726 | 21.2 | 300.4 | 0.40 | 7 | |
| .874 | 1.0 | 301.7 | 0.48 | 7 | |
| 1894.20 | 3 n | 337.17 | 0.40 | | |
| 1895.88 | 3 | 332.63 | 0.39 | | |
| 1897.32 | 2 | 331.75 | 0.35 | | |
| 1901.93 | 3 | 322.50 | 0.51 | | |
| 1909.42 | 3 | 312.57 | 0.58 | | |
| 1915.80 | 2 | 308.15 | 0.54 | | |
| 1917.58 | 4 | 300.32 | 0.45 | | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece | Remarks |
|------|----------|----------|----------|----------|---------|
| | <i>h</i> | <i>°</i> | <i>"</i> | | |

36 Andromedae, 482

0^h 49.6^m

+23° 5'

5.6 7.7

| | | | | | |
|----------|------|-------|------|-----|----------------------|
| 1908.756 | 22.7 | 31.4 | 0.99 | VI | |
| .759 | 22.5 | 29.0 | 0.99 | VII | |
| 1910.748 | 23.2 | 43.7 | 0.88 | VII | |
| 1915.783 | 23.8 | 41.2 | 0.89 | 9 | |
| .825 | 23.2 | 40.5 | 0.75 | 9 | |
| .868 | 23.4 | 42.7 | 0.75 | 9 | Very bad seeing. |
| 1917.012 | 2.4 | 43.0 | 0.60 | 9 | |
| .712 | 20.5 | 50.2 | 0.78 | 7 | Very bad. |
| .721 | 22.7 | 46.1 | 0.74 | 7 | |
| .726 | 21.0 | 44.9 | 0.80 | 7 | Very blurred. |
| 1892.80 | 3 n | 8.63 | 1.03 | | |
| 1893.82 | 3 | 10.20 | 1.16 | | |
| 1895.78 | 3 | 13.60 | 1.09 | | |
| 1897.20 | 3 | 15.40 | 1.20 | | |
| 1901.88 | 3 | 20.17 | 1.12 | | |
| 1904.87 | 3 | 23.27 | 0.97 | | |
| 1909.42 | 3 | 34.70 | 0.95 | | |
| 1915.83 | 3 | 41.47 | 0.80 | | Apparently at |
| 1917.54 | 4 | 46.05 | 0.73 | | apostroph about 1872 |

O Σ 515, 600

1^h 3.7^m

+46° 43'

4.3 ...

| | | | | | |
|----------|------|-------|------------------|---|--------------------------|
| 1917.721 | 22.5 | 198.3 | 0.30 <i>est.</i> | 7 | Notched. |
| .874 | 22.9 | 198.9 | 0.40 <i>est.</i> | 7 | Not separated. |
| 1903.18 | 1n | 243.2 | 0.25 | | There is an error in B's |
| 1917.80 | 2 | 198.6 | .35 | | apparent orbit. Rec- |
| | | | | | tilinear motion. |

| Date | Sid. T. | p | s | Eyepiece | Remarks |
|------|---------|------------|-----|----------|---------|
| | h | $^{\circ}$ | $'$ | | |

 Σ 183A B, 10021^h 49.4^m

+28° 19'

7.3 8.0

| | | | | | |
|----------|------------|--------|------------------|---|-------------------|
| 1917.726 | 21.3 | 179.5 | 0.35 <i>est.</i> | 9 | Elongated. |
| .839 | 22.9 | 349.1 | 0.51 | 7 | Blurred. |
| .874 | 23.1 | 169.1 | 0.41 | 7 | |
| 1917.81 | 3 <i>n</i> | 355.90 | 0.42 | | Very slow motion. |

 Σ 186, 10151^h 50.7^m

+1° 21'

5.9 6.7

| | | | | | |
|----------|------------|--------|------|---|------------------|
| 1915.047 | 3.1 | 39.5 | 0.85 | 7 | Very Blurred. |
| .783 | 0.0 | 217.2 | 0.90 | 9 | |
| .926 | 1.3 | 213.9 | 0.86 | 9 | Very bad seeing. |
| 1916.061 | 3.5 | 216.8 | 0.78 | 7 | |
| .822 | 22.8 | 215.8 | 0.95 | 7 | Blurred. |
| .940 | 1.2 | 215.4 | 0.82 | 7 | |
| 1917.012 | 2.7 | 214.7 | 0.81 | 9 | |
| .721 | 23.1 | 219.2 | 0.99 | 7 | |
| .839 | 23.1 | 220.3 | 0.99 | 7 | |
| .874 | 0.5 | 219.4 | 1.03 | 7 | |
| 1901.97 | 3 <i>n</i> | 203.70 | 0.55 | | |
| 1904.87 | 3 | 210.43 | .56 | | |
| 1915.70 | 4 | 216.85 | .85 | | |
| 1916.92 | 3 | 215.30 | .86 | | |
| 1917.81 | 3 | 219.63 | 1.00 | | |

OBSERVATIONS OF DOUBLE STARS

| Date | Sid. T. | p | s | Eyepiece | Remarks |
|------|---------|------------|-----|----------|---------|
| | h | $^{\circ}$ | $'$ | | |

48 Cassiopeiae, 1036

1^h 53.7^m

+70° 25'

4.6 7.7

| | | | | | |
|----------|-------|--------|-----------------|---|-------------------------|
| 1916.598 | 19.3 | 183.1 | 0.5 <i>est.</i> | 7 | Very blurred. |
| 1917.721 | 21.9 | 183.7 | 0.76 | 7 | |
| .726 | 20.9 | 187.9 | 0.73 | 7 | Very blurred. |
| .839 | 22.5 | 182.8 | 0.71 | 7 | Very blurred. Difficult |
| 1903. | 2 n | ? | ? | | |
| 1917.47 | 4-3 | 184.38 | 0.73 | | |

 γ Andromedae BC, 10701^h 57.8^m

+41° 51'

6.9 8.1

| | | | | | |
|----------|-------|--------|------|-----|------------------|
| 1908.759 | 22.7 | 112.2 | 0.43 | VII | |
| 1909.072 | 5.2 | 108.5 | 0.51 | VII | |
| 1915.783 | 0.2 | 110.6 | 0.54 | 9 | |
| .822 | 0.0 | 105.7 | 0.51 | 7 | Very blurred. |
| 1917.721 | 22.3 | 109.8 | 0.46 | 7 | |
| .726 | 21.7 | 110.3 | 0.42 | 7 | Very bad seeing. |
| .839 | 23.4 | 108.4 | 0.49 | 7 | |
| .842 | 22.3 | 108.7 | 0.54 | 7 | Bad seeing? |
| .871 | 0.4 | 111.6 | 0.42 | 7 | Very blurred. |
| 1897.33 | 2 n | 121.30 | 0.25 | | |
| 1902.12 | 3 | 109.27 | .43 | | |
| 1904.28 | 3 | 110.03 | .47 | | |
| 1906.20 | 2 | 93.90 | .37 | | |
| 1908.92 | 2 | 110.35 | .47 | | |
| 1915.80 | 2 | 108.15 | .52 | | |
| 1917.80 | 5 | 109.76 | .47 | | |

OBSERVATIONS OF DOUBLE STARS

13

| Date | Sid. T. | p | s | Eye-piece | Remarks |
|------|---------|------------|-----|-----------|---------|
| | h | $^{\circ}$ | $'$ | | |

 Σ 228, 11442^h 7.6^m

+47° 2'

6.4 7.2

| | | | | | |
|----------|------|--------|------|-----|---------------|
| 1908.759 | 22.8 | 100.2 | 0.59 | VII | Sep. Blurred. |
| 1909.072 | 5.4 | 98.2 | 0.53 | VII | |
| 1915.783 | 0.3 | 110.8 | 0.63 | 9 | |
| .841 | 23.8 | 110.8 | 0.65 | 9 | |
| 1917.721 | 22.1 | 115.9 | 0.56 | 7 | |
| .839 | 23.6 | 116.7 | 0.51 | 7 | |
| .874 | 23.3 | 115.0 | 0.63 | 7 | |
| 1895.45 | 2 n | 69.50 | 0.44 | | |
| 1902.11 | 3 | 87.27 | .56 | | |
| 1904.83 | 2 | 91.65 | .52 | | |
| 1906.20 | 2 | 89.35 | .55 | | |
| 1908.91 | 2 | 99.20 | .56 | | |
| 1915.81 | 2 | 110.80 | .64 | | |
| 1917.81 | 3 | 115.87 | .57 | | |

 β 83, 14202^h 41.0^m

-5° 23'

7.9 10.5

| | | | | | |
|----------|-----|-------|------|---|-----------|
| 1917.874 | 1.3 | 101.7 | 0.72 | 7 | Difficult |
|----------|-----|-------|------|---|-----------|

 Σ 305, 14272^h 41.8^m

+18° 58'

6.9 7.8

| | | | | | |
|----------|------|-------|------|----|--|
| 1915.926 | 2.0 | 316.4 | 3.40 | V | |
| 1916.006 | 2.7 | 315.6 | 2.93 | 12 | |
| .020 | 3.9 | 314.4 | 3.11 | V | |
| .822 | 23.1 | 317.6 | 3.11 | 7 | |
| .929 | 1.0 | 316.2 | 3.05 | 7 | |
| 1917.015 | 3.4 | 314.0 | 3.24 | 12 | |

OBSERVATIONS OF DOUBLE STARS

| Date | Sid. T. | p | s | Eyepiece | Remarks |
|------|---------|------------|-----|----------|---------|
| | h | $^{\circ}$ | $'$ | | |

 Σ 305, 1427—Continued

| | | | | | |
|----------|-------|--------|------|----|-------------|
| 1917.119 | 5.8 | 313.0 | 2.91 | 12 | Bad seeing. |
| .129 | 5.3 | 313.6 | 2.99 | 12 | |
| .874 | 0.7 | 316.3 | 3.34 | 7 | |
| .891 | 0.1 | 314.3 | 3.14 | 12 | |
| 1918.115 | 5.6 | 312.5 | 3.24 | 12 | |
| 1915.98 | 3 n | 315.47 | 3.15 | | |
| 1917.00 | 5 | 314.88 | 3.06 | | |
| 1917.96 | 3 | 314.37 | 3.24 | | |

 Σ 333 ϵ Arietis, 1512
+20° 55'2^b 53.5^m

5.2 5.5

| | | | | | |
|----------|-------|--------|------|-----|---------------------------|
| 1909.072 | 5.0 | 201.8 | 1.44 | VII | Very bad seeing. Good. |
| 1915.045 | 3.7 | 203.2 | 1.31 | 9 | |
| .163 | 6.2 | 203.8 | 1.57 | 7 | |
| .860 | 0.9 | 203.1 | 1.22 | 12 | |
| 1916.020 | 4.1 | 202.3 | 1.65 | 7 | |
| .061 | 3.7 | 203.2 | 1.33 | 7 | |
| .822 | 23.3 | 200.8 | 1.11 | 9 | |
| 1917.015 | 3.2 | 198.5 | 1.09 | 12 | |
| .119 | 6.0 | 203.9 | 1.21 | 9 | |
| .129 | 5.1 | 204.6 | 1.09 | 12 | Bad seeing. |
| .874 | 23.9 | 202.5 | 1.50 | 7 | |
| 1918.115 | 5.3 | 202.9 | 1.47 | 7 | |
| 1895.04 | 3 n | 199.07 | 1.36 | | |
| 1901.88 | 3 | 200.63 | 1.34 | | |
| 1903.99 | 3 | 200.77 | 1.18 | | |
| 1909.07 | 1 | 201.80 | 1.44 | | |
| 1915.10 | 2 | 202.87 | 1.40 | | |
| 1917.02 | 4 | 201.95 | 1.14 | | |
| 1917.99 | 2 | 202.70 | 1.48 | | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece | Remarks |
|---------------------------------------|------------|-----------------|------------------|----------------|------------------------|
| | <i>h</i> | <i>°</i> | <i>'</i> | | |
| O Σ 53, 1639 | | | | | |
| 3^h 11.3^m | | +38° 16' | | 7.3 10. | |
| 1909.072 | 5.6 | 227.5 | 0.39 | VII | |
| 1915.163 | 6.4 | 214.4 | 0.37 | 7 | Not separated. |
| .783 | 0.5 | 204.6 | 0.35 | 7 | Separated by glimpses. |
| .839 | 23.9 | 188.7 | 0.30 <i>est.</i> | 7 | Wedge |
| 1917.874 | 0.4 | 194.3 | 0.30 <i>est.</i> | 7 | Elongated. |
| 1893.82 | 3 <i>n</i> | 244.27 | 0.53 | | |
| 1897.59 | 2 | 241.35 | .54 | | |
| 1901.94 | 3 | 234.47 | .52 | | |
| 1905.50 | 2 | 233.40 | .34 | | |
| 1909.07 | 1 | 227.50 | .39 | | |
| 1915.59 | 3 | 202.57 | .34 | | |
| 1917.87 | 1 | 194.30 | .30 | | |

| | | | | | |
|---------------------------------------|------------|-----------------|------|----------------|-----------------------|
| O Σ 65, 1900 | | | | | |
| 3^h 44.3^m | | +25° 17' | | 6.3 6.9 | |
| 1909.072 | 5.9 | 205.5 | 0.82 | VII | |
| 1915.852 | 1.0 | 202.2 | 0.70 | 9 | Very blurred. |
| .926 | 1.1 | 201.6 | 0.56 | 9 | Bad seeing. |
| 1916.020 | 4.3 | 201.5 | 0.59 | 7 | |
| .185 | 7.0 | 204.8 | 0.63 | 7 | |
| .822 | 23.8 | 204.6 | 0.52 | 7 | Difficult, uncertain. |
| 1917.119 | 6.3 | 208.7 | 0.50 | 7 | Poor. |
| .160 | 6.1 | 208.2 | 0.58 | 7 | |
| .163 | 5.7 | 208.5 | 0.49 | 7 | |
| 1917.839 | 0.2 | 203.1 | 0.62 | 7 | |
| .874 | 0.2 | 207.8 | 0.58 | 7 | |
| 1918.115 | 5.1 | 207.2 | 0.48 | 7 | Poor seeing. |
| 1901.93 | 3 <i>n</i> | 200.97 | 0.59 | | |
| 1907.62 | 2 | 205.15 | .81 | | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece | Remarks |
|------|---------|----------|----------|----------|---------|
| | h | ° | ' | | |

O Σ 65, 1900—Continued

| | | | | | |
|---------|---|--------|------|--|--|
| 1916.00 | 4 | 202.52 | 0.62 | | |
| 1917.07 | 4 | 207.50 | .52 | | |
| 1917.94 | 3 | 206.03 | .56 | | |

 Σ 483, 20073^h 57.4^m

+39° 14'

7.2 9.4

| | | | | | |
|----------|------|--------|------|----|----------|
| 1916.185 | 7.2 | 190.1 | 0.82 | 7 | Blurred. |
| .190 | 7.3 | 192.7 | 0.81 | 12 | |
| 1917.839 | 0.1 | 181.3 | 0.74 | 7 | |
| .874 | 23.7 | 181.7 | 0.81 | 7 | |
| 1916.19 | 2 n | 191.40 | 0.82 | | |
| 1917.86 | 2 | 183.50 | .78 | | |

40 Eridani, B C, 219

4^h 10.7^m

-7° 49'

9.2 11.0

| | | | | | |
|----------|-----|-------|-------|----|--------|
| 1917.160 | 6.0 | 22.8 | 3.22 | V | Faint. |
| .164 | 6.1 | 22.3 | 2.96 | V | |
| 1918.115 | 4.8 | 200.2 | 3.40 | V | |
| .129 | 5.7 | 23.0 | 3.05 | V | |
| .163 | 6.4 | 19.4 | 3.07 | 30 | |
| 1893.21 | 1 n | 93.8 | 2.18 | | |
| 1896.95 | 1 | 79.5 | ..... |  |  |
| 1901.88 | 1 | 64.0 | 2.41 | | |
| 1902.00 | 4 | 61.90 | 2.25 | | |
| 1903.18 | 1 | 55.9 | 1.97 | | |
| 1917.16 | 2 | 22.55 | 3.09 | | |
| 1918.14 | 3 | 20.87 | 3.17 | | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece | Remarks |
|------|----------|----------|----------|----------|---------|
| | <i>h</i> | <i>°</i> | <i>"</i> | | |

O Σ 79, 21344^h 14.2^m

+16° 17'

6.9 9.0

| | | | | | |
|----------|------------|--------|------------------|---|---|
| 1915.163 | 7.0 | 336.5 | 0.44 | 7 | Dist. impossible Barely separated. Blurred. |
| 1916.185 | 7.4 | 331.4 | 0.5 <i>est.</i> | 7 | |
| .190 | 7.5 | 331.8 | 0.50 | 9 | |
| 1917.839 | 0.4 | 340.7 | 0.35 <i>est.</i> | 7 | |
| 1902.08 | 2 <i>n</i> | 261.80 | 0.20 | | |
| 1903.16 | 3 | 261.43 | .29 | | |
| 1915.16 | 1 | 336.50 | .44 | | |
| 1916.19 | 2 | 331.60 | .50 | | |
| 1917.84 | 1 | 340.70 | .35 | | |

O Σ 82, 21544^h 17.1^m

+14° 51'

7.1 8.4

| | | | | | |
|----------|------------|--------|------------------|-----|--|
| 1907.168 | 7.3 | 97.5 | 0.65 | VII | Bad. Too bad for dist. Bad seeing. |
| 1914.204 | 6.8 | 81.7 | 0.71 | (9) | |
| 1915.163 | 7.2 | 71.0 | 0.62 | 7 | |
| 1916.020 | 4.6 | 67.8 | 0.60 | 7 | |
| .185 | 7.7 | 70.0 | 0.68 | 9 | |
| 1917.119 | 6.5 | 72.0 | 0.65 <i>est.</i> | 7 | |
| .234 | 8.0 | 67.9 | .... | V | |
| .970 | 2.1 | 71.1 | 0.72 | 7 | |
| 1918.115 | 5.9 | 68.0 | 0.59 | 7 | |
| 1919.220 | 7.6 | 66.1 | 0.53 | 9 | |
| .245 | 8.2 | 63.6 | 0.60 | 7 | |
| .247 | 7.7 | 63.8 | 0.75 | 9 | |
| 1893.17 | 1 <i>n</i> | 151.9 | 0.56 | | |
| 1896.95 | 1 | 137.1 | .55 | | |
| 1902.01 | 3 | 119.17 | .61 | | |

Ob

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece | Remarks |
|------|---------|----------|----------|-----------|---------|
| | h | ° | " | | |

O Σ 82, 2154—Continued

| | | | | | |
|---------|-----|-------|------|--|--|
| 1907.17 | 1 | 97.50 | 0.65 | | |
| 1914.68 | 2 | 76.35 | .66 | | |
| 1916.64 | 4-3 | 69.42 | .64 | | |
| 1918.04 | 2 | 69.55 | .66 | | |
| 1919.24 | 3 | 64.50 | .63 | | |

 β 552, Orionis 11, 23834^h 46.2^m

+13° 29'

6.7 9.8

| | | | | | |
|----------|-----|--------|------------------|------|------------------|
| 1907.168 | 7.1 | 243.8 | 0.50 | VIII | |
| 1909.072 | 4.7 | 229.3 | 0.61 | VII | |
| 1915.163 | 7.4 | 256.8 | 0.59 | 9 | Poor seeing. |
| 1916.190 | 7.7 | 257.7 | 0.63 | 7 | |
| .212 | 7.7 | 257.7 | 0.45 <i>est.</i> | 7 | Very bad seeing. |
| 1902.91 | 4 n | 220.10 | 0.41 | | |
| 1908.12 | 2 | 236.55 | .56 | | |
| 1915.86 | 3 | 257.40 | .56 | | |

O Σ 92, 24454^h 53.4^m

+39° 15'

6.0 10.1

| | | | | | |
|----------|-----|-------|------|----|------|
| 1910.179 | 6.7 | 255.8 | 2.84 | VI | |
| .182 | 6.9 | 254.2 | 3.03 | VI | |
| 1915.926 | 0.7 | 260.9 | 2.99 | V | |
| 1916.006 | 3.2 | 260.7 | 2.96 | 30 | |
| .174 | 7.4 | 257.2 | 3.26 | V | |
| 1917.015 | 3.7 | 258.0 | 3.21 | 30 | Bad. |
| .209 | 8.0 | 258.3 | 3.04 | V | |
| .226 | 8.1 | 256.6 | 3.05 | V | |
| .970 | 2.3 | 264.0 | 3.04 | V | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece | Remarks |
|------|----------|----------|----------|----------|---------|
| | <i>h</i> | <i>°</i> | <i>"</i> | | |

O Σ 92, 2445—Continued

| | | | | | |
|----------|------------|--------|------|----|--------------|
| 1918.115 | 7.4 | 254.7 | 3.34 | 30 | Poor seeing. |
| .163 | 6.8 | 256.8 | 3.19 | V | |
| 1902.09 | 2 <i>n</i> | 252.55 | 2.96 | | |
| 1910.18 | 2 | 255.00 | 2.94 | | |
| 1916.04 | 3 | 259.60 | 3.07 | | |
| 1917.15 | 3 | 257.63 | 3.10 | | |
| 1918.08 | 3 | 258.50 | 3.19 | | |

O Σ 98, 14 Orionis, 25355^h 2.5^m

+8° 22'

5.5 7.4

| | | | | | |
|----------|-----|-------|------|-----|------------------|
| 1907.168 | 7.5 | 164.1 | 0.87 | VII | |
| 1908.256 | 8.7 | 161.0 | 0.83 | VII | |
| .261 | 9.4 | 158.3 | 0.74 | VII | Blurred. |
| 1910.179 | 6.9 | 162.7 | 0.95 | VI | Blurred. |
| .182 | 7.1 | 163.3 | 0.98 | VI | Blurred. |
| 1915.165 | 7.0 | 151.2 | 0.76 | 9 | |
| .253 | 8.2 | 145.9 | 0.76 | 12 | Poor seeing. |
| 1916.061 | 4.3 | 146.4 | 0.88 | 7 | Poor seeing. |
| .174 | 7.2 | 147.3 | 0.76 | 9 | Bad seeing. |
| 1917.129 | 5.7 | 145.0 | 0.89 | 12 | Very bad seeing. |
| .160 | 6.6 | 149.3 | 0.89 | 7 | |
| .163 | 6.3 | 150.2 | 0.90 | 7 | |
| .165 | 6.3 | 147.3 | 0.82 | 7 | |
| .970 | 2.6 | 145.0 | 0.73 | 7 | Very bad seeing. |
| 1918.129 | 6.2 | 145.1 | 0.79 | 7 | Poor seeing. |
| .168 | 7.1 | 144.2 | 0.89 | 7 | Poor seeing. |
| .207 | 8.3 | 143.2 | 0.76 | 7 | |
| 1919.220 | 7.8 | 141.6 | 0.86 | 7 | Poor seeing. |

OBSERVATIONS OF DOUBLE STARS

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece | Remarks |
|------|---------|----------|----------|-----------|---------|
| | h | ° | ' | | |

O Σ 98, 14 Orionis, 2535—Continued

| | | | | | |
|----------|------------|--------|------|---|-------------|
| 1919.237 | 8.2 | 138.5 | 0.75 | 7 | Bad seeing. |
| .245 | 8.4 | 140.9 | 0.84 | 7 | Very bad. |
| 1893.72 | 2 <i>n</i> | 188.85 | 0.90 | | |
| 1895.21 | 3-2 | 185.23 | .84 | | |
| 1896.26 | 3 | 185.23 | .78 | | |
| 1898.22 | 1 | 178.3 | .97 | | |
| 1902.07 | 3 | 170.40 | 0.77 | | |
| 1906.23 | 3 | 164.27 | 1.05 | | |
| 1907.90 | 3 | 161.13 | 0.81 | | |
| 1910.18 | 2 | 163.00 | .96 | | |
| 1915.21 | 2 | 148.55 | .76 | | |
| 1916.12 | 2 | 146.85 | .82 | | |
| 1917.17 | 4 | 147.95 | .88 | | |
| 1918.12 | 4 | 144.38 | .79 | | |
| 1919.23 | 3 | 140.33 | .82 | | |

O Σ 517, 25885^h 8.3^m

+1° 51'

6.2 ...

| | | | | | |
|----------|------------|--------|-----------------|------|------------|
| 1907.168 | 7.0 | 327.5 | 0.3 <i>est.</i> | VIII | Elongated. |
| 1903.16 | 2 <i>n</i> | 302.85 | 0.28 | | |
| 1907.17 | 1 | 327.5 | .30 | | |

O Σ 149, 34746^h 30.2^m

+27° 22'

6.9 9.4

| | | | | | |
|----------|-----|-------|------|-----|-------------|
| 1908.261 | 9.6 | 267.3 | 0.55 | VII | |
| .283 | 9.5 | 264.2 | 0.64 | VII | |
| 1915.165 | 7.9 | 260.2 | 0.52 | 9 | Bad seeing. |
| .190 | 9.1 | 258.6 | 0.50 | 7 | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece | Remarks |
|------|----------|----------|----------|-----------|---------|
| | <i>h</i> | <i>°</i> | <i>"</i> | | |

O Σ 149, 3474—Continued

| | | | | | |
|----------|------------|--------|-----------------|---------------|-------------------|
| 1916.190 | 8.0 | 256.5 | 0.49 | 7 | |
| .218 | 8.0 | 257.1 | 0.52 | 7 | Barely separated. |
| 1918.207 | 8.9 | 255.8 | 0.5 <i>est.</i> | 7 | Very difficult. |
| 1919.247 | 8.0 | ..... | ..... |  | Cannot. |
| .300 | 7.2 | ..... | Suspect | elongation in | 260° |
| 1894.49 | 4 <i>n</i> | 283.92 | 0.55 | | |
| 1896.24 | 4 | 282.12 | .60 | | |
| 1897.29 | 2 | 281.71 | .68 | | |
| 1898.26 | 2 | 280.40 | .57 | | |
| 1899.26 | 2 | 276.50 | .61 | | |
| 1901.29 | 2 | 272.90 | .68 | | |
| 1902.07 | 3 | 275.50 | .72 | | |
| 1906.23 | 2 | 268.75 | .82 | | |
| 1908.27 | 2 | 265.75 | .60 | | |
| 1915.18 | 2 | 259.40 | .51 | | |
| 1916.20 | 2 | 256.80 | .50 | | |
| 1918.21 | 1 | 255.8 | .50 | | |
| 1919.27 | 2 | ..... | Suspect | elongation in | 260° |

Sirius, 3596

6^h 40.7^m

—16° 35'

—1.6 10.4

| | | | | | |
|----------|-----|-------|-------|----|-----------------|
| 1907.168 | 6.8 | 98.3 | 7.72 | VI | Good. |
| .226 | 8.2 | 100.6 | 7.76 | VI | Difficult. |
| 1908.256 | 9.0 | 95.9 | 8.44 | X | Good. |
| .261 | 9.2 | 94.2 | 8.43 | X | Good. |
| 1912.237 | 7.8 | 84.6 | 9.04 | X | Very difficult. |
| .242 | 8.4 | 86.3 | 9.74 | V | Good. |
| 1915.163 | 6.7 | 76.6 | 10.67 | 7 | Good. |

OBSERVATIONS OF DOUBLE STARS

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece | Remarks |
|------|---------|----------|----------|-----------|---------|
| | h | ° | " | | |

Sirius, 3596—Continued

| | | | | | |
|----------|-----|-------|-------|----|------------|
| 1915.165 | 7.7 | 77.0 | 10.59 | V | Good. |
| 1916.157 | 7.2 | 76.2 | .... | 30 | |
| .185 | 7.9 | 76.4 | 10.76 | V | |
| .218 | 7.5 | 77.0 | 10.80 | V | |
| 1917.160 | 6.8 | 73.9 | 10.76 | 30 | |
| .163 | 6.7 | 71.5 | 11.82 | 30 | |
| .212 | 7.4 | 75.8 | 11.03 | 30 | |
| 1918.100 | 6.9 | 70.7 | 11.41 | 30 | |
| .115 | 6.5 | 69.9 | 10.85 | V | Good. |
| .166 | 7.4 | 72.9 | 11.50 | 30 | Difficult. |
| .207 | 8.1 | 73.1 | 10.79 | V | |
| 1919.220 | 7.3 | 69.2 | 10.11 | 30 | Good. |
| .237 | 7.8 | 68.6 | 10.99 | 30 | Good. |
| .245 | 8.0 | 68.4 | 10.87 | V | Difficult. |
| 1903. | 2 n | ? | ? | | |
| 1907.20 | 2 | 99.45 | 7.74 | | |
| 1908.26 | 2 | 95.05 | 8.44 | | |
| 1912.24 | 2 | 85.45 | 9.89 | | |
| 1915.16 | 2 | 76.80 | 10.63 | | |
| 1916.19 | 3-2 | 76.53 | 10.78 | | |
| 1917.18 | 3-2 | 73.73 | 10.90 | | |
| 1918.15 | 4 | 71.65 | 11.14 | | |
| 1919.23 | 3 | 68.73 | 10.66 | | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece | Remarks |
|------|---------|----------|----------|-----------|---------|
| h | ° | " | | | |

Castor, 4122

7^h 28.2^m

+32° 6'

2.0 2.8

| | | | | | |
|----------|------|--------|------|----|---------------|
| 1908.292 | 9.4 | 222.6 | 5.52 | X | Thro. clouds. |
| .297 | 9.2 | 221.3 | 5.57 | X | |
| 1914.275 | 8.7 | 219.1 | 5.37 | 30 | |
| .286 | 11.6 | 220.4 | 5.19 | V | |
| .300 | 9.0 | 218.6 | .... | V | Clouds. |
| 1915.310 | 12.4 | 219.0 | 5.26 | V | |
| .360 | 11.0 | 219.7 | 5.45 | 12 | Blurred. |
| 1917.275 | 9.1 | 216.1 | 5.01 | 12 | Good. |
| .286 | 9.2 | 220.1 | 5.23 | 9 | Very diffuse. |
| 1919.237 | 8.8 | 216.9 | 5.18 | V | Good. |
| .278 | 9.9 | 216.4 | 5.07 | 7 | |
| .294 | 9.1 | 216.3 | 5.05 | 7 | |
| 1892.85 | 2 n | 229.25 | 5.60 | | |
| 1894.30 | 2 | 228.00 | 5.66 | | |
| 1895.29 | 3 | 227.90 | 5.64 | | |
| 1896.31 | 3 | 227.53 | 5.56 | | |
| 1897.30 | 3 | 227.87 | 5.75 | | |
| 1899.27 | 3 | 226.83 | 5.52 | | |
| 1901.37 | 3 | 226.77 | 5.75 | | |
| 1902.24 | 3 | 225.33 | 5.78 | | |
| 1903.31 | 2 | 225.10 | 5.76 | | |
| 1906.24 | 2 | 222.75 | 5.73 | | |
| 1908.29 | 2 | 221.95 | 5.55 | | |
| 1914.29 | 3-2 | 219.37 | 5.28 | | |
| 1915.33 | 2 | 219.35 | 5.35 | | |
| 1917.28 | 2 | 218.10 | 5.12 | | |
| 1919.27 | 3 | 216.53 | 5.10 | | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece | Remarks |
|------|----------|----------|----------|----------|---------|
| | <i>h</i> | <i>°</i> | <i>'</i> | | |

Procyon, 4187

7^h 34.1^m

+5° 29'

0.5 ...

| | | | | | |
|----------|-----|--|--------|-----|--------|
| 1908.261 | 9.8 | | Cannot | see | comes. |
|----------|-----|--|--------|-----|--------|

9 Argus, 4310

7^h 47.1^m

-13° 38'

5.3 ...

| | | | | | |
|----------|------------|--------|------------------|----------|------------|
| 1915.313 | 10.4 | 241.2 | 0.30 <i>est.</i> | 7 | Elongated. |
| 1916.190 | 8.1 | | Suspect | comes in | 270° |
| 1894.24 | 3 <i>n</i> | 286.62 | 0.35 | | |
| 1895.21 | 2 | 285.20 | .42 | | |
| 1896.24 | 3 | 287.00 | .49 | | |
| 1903.15 | 3 | 308.00 | .49 | | |
| 1906.25 | 1 | 322.4 | .... |  |  |
| 1915.31 | 1 | 241.2 | .30 | | |
| 1916. | 1 | ? | ? | | |

O Σ 185, 4355

7^h 52.1^m

+1° 24'

6.4 ...

| | | | | | |
|----------|------|-------|------------------|-----|---------------------|
| 1907.168 | 7.7 | 25.7 | 0.53 | VII | Notched, Blurred. |
| 1910.245 | 8.7 | 29.1 | 0.48 <i>est.</i> | VII | Suspect elongation. |
| 1914.275 | 9.0 | 42.1 | 0.30 <i>est.</i> | 7 | Suspect elongation. |
| 1915.190 | 8.9 | 38.9 | 0.36 | 7 | Notched. |
| .278 | 9.2 | 39.2 | 0.30 | 7 | Notched. Good. |
| 1916.190 | 8.2 | 38.4 | 0.35 <i>est.</i> | 7 | Notched. |
| .223 | 7.8 | ..... | .... | .. | Cannot. |
| .319 | 10.3 | 40.1 | 0.40 <i>est.</i> | 7 | Not separated. |
| 1918.207 | 9.1 | 44.8 | 0.30 <i>est.</i> | 7 | Elongated. |
| .365 | 11.2 | 42.0 | 0.36 | 7 | Elongated. |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece | Remarks |
|------|----------|----------|----------|----------|---------|
| | <i>h</i> | <i>°</i> | <i>'</i> | | |

O Σ 185, 4355—Continued

| | | | | | |
|----------|----------------|-------|------------------|----|------------|
| 1919.300 | 9.3 | 47.6 | 0.30 <i>est.</i> | 7 | Elongated. |
| 1902.26 | 2 ⁿ | 23.65 | 0.44 | .. | |
| 1903.17 | 3 | 19.87 | .42 | | |
| 1906.53 | 3 | 26.77 | .45 | .. | |
| 1910.24 | 1 | 29.1 | .48 | .. | |
| 1914.91 | 3 | 40.07 | .32 | | |
| 1916.25 | 2 | 39.25 | .38 | | |
| 1918.62 | 3 | 44.80 | .32 | .. | |

 β 581, A B., 44147^h 58.7^m

+12° 35'

7.9 9.8

| | | | | | |
|----------|----------------|--------|------------------|---|---------------------|
| 1915.313 | 10.6 | 303.1 | 0.30 <i>est.</i> | 7 | Barely separated. |
| .330 | 10.3 | 299.8 | 0.30 <i>est.</i> | 7 | Blurred. Elongated. |
| 1916.319 | 10.4 | 315.5 | 0.38 | 7 | Notched. |
| 1917.292 | 9.3 | 344.8 | 0.35 <i>est.</i> | 7 | Very uncertain. |
| 1919.278 | 10.1 | 338.8 | 0.30 <i>est.</i> | 7 | |
| .300 | 9.6 | 350.6 | 0.35 <i>est.</i> | 7 | Not separated. |
| 1895.28 | 3 ⁿ | 271.90 | 0.34 | | |
| 1896.24 | 3 | 272.93 | .37 | | |
| 1897.33 | 2 | 275.50 | .45 | | |
| 1898.25 | 2 | 280.55 | .49 | | |
| 1899.26 | 2 | 282.75 | .59 | | |
| 1903.61 | 5 | 304.66 | .34 | | |
| 1915.32 | 2 | 301.45 | .30 | | |
| 1916.81 | 2 | 330.15 | .37 | | |
| 1919.29 | 2 | 344.70 | .32 | | |

| Date | Sid. T. | p | s | Eyepiece | Remarks |
|------|---------|------------|-----|----------|---------|
| | h | $^{\circ}$ | $'$ | | |

Idem $\frac{1}{2}(A+B)$ C

| | | | | | |
|----------|------|--------|------|----|----------------------------|
| 1915.313 | 10.7 | 196.2 | 4.49 | V | Good. |
| .330 | 10.5 | 195.1 | 4.58 | V | |
| 1916.319 | 10.6 | 197.0 | 4.65 | V | |
| 1917.234 | 8.3 | 196.9 | 4.66 | V | |
| .292 | 9.2 | 197.5 | 4.59 | V | |
| 1919.245 | 8.6 | 198.3 | 4.65 | 30 | |
| .278 | 10.2 | 196.5 | 4.57 | 30 | |
| .300 | 9.5 | 198.0 | 4.71 | 30 | A C $\frac{1}{2}(A+B)C$ |
| 1895.28 | 3 n | 191.53 | 4.45 | | |
| 1896.24 | 3 | 192.60 | 4.58 | | |
| 1897.96 | 3 | 195.50 | 4.69 | | |
| 1899.26 | 2 | 193.40 | 4.58 | | |
| 1902.26 | 2 | 194.80 | 4.58 | | |
| 1906.27 | 2 | 195.60 | 4.68 | | |
| 1915.32 | 2 | 195.65 | 4.54 | | |
| 1916.95 | 3 | 197.13 | 4.63 | | |
| 1919.27 | 3 | 197.60 | 4.64 | | |

 ζ Cancr AB, 4477 $8^h 6.5^m$ $+17^{\circ} 57'$

6.0 6.3 5.6

| | | | | | |
|----------|-----|-------|------|-----|---------------|
| 1907.168 | 7.9 | 343.0 | 1.20 | VII | Good. |
| .174 | 7.7 | 342.4 | 0.90 | VII | Very blurred. |
| .250 | 8.1 | 342.4 | 1.12 | VI | |
| .300 | 8.8 | 343.1 | 1.11 | VII | Good. |
| 1908.256 | 8.3 | 340.1 | 1.04 | VII | |
| .261 | 8.8 | 340.5 | 1.01 | VII | Good. |
| .283 | 9.0 | 342.2 | 1.09 | VII | |
| 1909.072 | 6.2 | 333.8 | 1.09 | VII | |

| Date | Sid. T. | p | s | Eye-piece | Remarks |
|------|---------|-----|-----|-----------|---------|
| | h | ° | " | | |

ζ Cancri AB, 4477—Continued

| | | | | | |
|----------|------|-------|------|-----|------------------|
| 1909.346 | 10.3 | 332.5 | 0.94 | VII | |
| .354 | 11.6 | 331.0 | 0.93 | VII | |
| 1910.234 | 7.9 | 331.7 | 0.84 | VI | |
| .245 | 8.3 | 333.3 | 0.90 | VII | Good. |
| .281 | 10.0 | 327.9 | 0.97 | VII | Poor seeing. |
| 1912.212 | 7.9 | 321.8 | 0.95 | VI | |
| .237 | 8.1 | 328.1 | 0.91 | VII | |
| .242 | 8.7 | 318.8 | 0.88 | VII | |
| 1914.223 | 8.1 | 309.8 | 0.81 | 7 | |
| .275 | 9.1 | 311.2 | 0.90 | 9 | |
| .368 | 11.2 | 312.4 | 0.79 | 9 | |
| 1915.190 | 8.4 | 306.0 | 0.79 | 9 | |
| .237 | 10.0 | 304.3 | 0.71 | 7 | Very bad seeing. |
| .242 | 9.4 | 305.5 | 0.69 | 7 | |
| 1916.185 | 8.2 | 303.0 | 0.93 | 9 | |
| .190 | 8.5 | 300.7 | 0.85 | 7 | |
| .212 | 8.0 | 300.8 | 0.79 | 9 | Very bad seeing. |
| .218 | 8.3 | 303.0 | 0.76 | 7 | Bad seeing. |
| 1917.160 | 7.2 | 301.3 | 0.66 | 7 | |
| .164 | 6.5 | 298.3 | 0.77 | 7 | |
| .212 | 7.9 | 296.4 | 0.71 | 7 | |
| .226 | 8.4 | 296.0 | 0.62 | 7 | |
| 1918.115 | 6.8 | 295.5 | 0.58 | 7 | |
| .207 | 8.4 | 290.6 | 0.70 | 7 | Good. |
| .210 | 7.3 | 294.5 | 0.71 | 7 | Very bad seeing. |
| .237 | 8.2 | 291.0 | 0.73 | 7 | Poor seeing. |
| .346 | 11.0 | 291.0 | 0.69 | 7 | |
| 1919.220 | 8.0 | 284.9 | 0.74 | 7 | Fair. |
| .237 | 8.4 | 283.6 | 0.86 | 7 | |

| Date | Sid. T. | p | s | Eyepiece | Remarks |
|------|---------|-----|-----|----------|---------|
| | h | ° | " | | |

ζ Cancri AB, 4477—Continued

| | | | | | |
|----------|-----|--------|------|---|-------|
| 1919.247 | 8.0 | 286.4 | 0.72 | 7 | Good. |
| .294 | 9.3 | 284.4 | 0.64 | 7 | |
| 1920.240 | 9.0 | 279.4 | 0.70 | 7 | |
| 1890.27 | 2 n | 36.45 | 0.94 | | |
| 1893.20 | 2 | 27.25 | 0.98 | | |
| 1894.23 | 3 | 22.87 | 0.93 | | |
| 1895.23 | 3 | 20.93 | 1.01 | | |
| 1896.25 | 4 | 17.72 | 1.06 | | |
| 1897.29 | 4 | 12.78 | 1.18 | | |
| 1898.26 | 4 | 11.67 | 1.22 | | |
| 1899.25 | 4 | 6.20 | 1.05 | | |
| 1901.30 | 5 | 2.18 | 1.07 | | |
| 1902.20 | 5 | 359.62 | 1.10 | | |
| 1903.15 | 5 | 356.18 | 1.23 | | |
| 1904.24 | 3 | 353.80 | 1.21 | | |
| 1906.23 | 4 | 346.42 | 1.27 | | |
| 1907.22 | 4 | 342.72 | 1.08 | | |
| 1908.27 | 3 | 340.93 | 1.05 | | |
| 1909.26 | 3 | 332.43 | 0.99 | | |
| 1910.25 | 3 | 330.97 | 0.90 | | |
| 1912.23 | 3 | 322.90 | 0.91 | | |
| 1914.29 | 3 | 311.13 | 0.83 | | |
| 1915.22 | 3 | 305.27 | 0.73 | | |
| 1916.20 | 4 | 301.87 | 0.83 | | |
| 1917.19 | 4 | 298.00 | 0.69 | | |
| 1918.22 | 5 | 292.52 | 0.68 | | |
| 1919.25 | 4 | 284.82 | 0.74 | | |
| 1920.24 | 1 | 279.4 | 0.70 | | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece | Remarks |
|------|---------|----------|----------|-----------|---------|
| | h | ° | ' | | |

Idem, AC.

| | | | | | |
|----------|------|-------|------|-----|------------------------|
| 1907.168 | 8.0 | 108.0 | 5.22 | VII | |
| .174 | 7.9 | 108.3 | 5.28 | VII | Blurred. |
| .250 | 8.3 | 108.6 | 5.30 | VI | |
| .300 | 8.9 | 108.7 | 5.24 | VII | Good. |
| 1908.256 | 8.5 | 108.8 | 5.03 | VII | |
| .261 | 9.0 | 109.4 | 5.19 | VII | |
| .283 | 9.2 | 109.8 | 5.15 | VII | |
| 1909.072 | 6.4 | 109.5 | 5.04 | VII | |
| .346 | 10.4 | 107.5 | 5.07 | VII | |
| .354 | 11.8 | 107.8 | 5.15 | VII | |
| 1910.234 | 7.9 | 109.6 | 4.75 | VI | |
| .245 | 8.5 | 110.0 | 4.87 | VII | |
| .281 | 10.2 | 108.6 | 4.93 | VII | Good. |
| 1912.212 | 8.0 | 112.1 | 4.68 | VI | Poor seeing. |
| .237 | 8.3 | 111.1 | 4.54 | VII | |
| .242 | 8.8 | 113.7 | 4.78 | VII | |
| 1914.223 | 8.3 | 111.8 | 4.99 | 7 | |
| .275 | 9.3 | 110.4 | 4.88 | 9 | |
| .368 | 11.4 | 113.4 | 4.81 | 9 | |
| 1915.190 | 8.5 | 113.8 | 5.06 | 9 | |
| .237 | 10.2 | 111.8 | 4.98 | 7 | Very bad seeing. |
| .242 | 9.6 | 114.0 | 4.82 | 7 | |
| 1916.185 | 8.3 | 112.2 | 5.07 | 9 | |
| .190 | 8.7 | 111.8 | 4.95 | 7 | |
| .212 | 8.1 | 113.8 | 4.77 | 9 | Very bad seeing. |
| .218 | 8.5 | 111.6 | 5.32 | 12 | $\frac{1}{2}$ (A+B) C |
| 1917.160 | 7.4 | 111.4 | 5.59 | V | $\frac{1}{2}$ (A+B) C. |
| .164 | 6.7 | 114.2 | 4.86 | 7 | A C. |
| .212 | 8.1 | 112.2 | 5.42 | 7 | $\frac{1}{2}$ (A+B) C |

| Date | Sid. T. | p | s | Eyepiece | Remarks |
|------|---------|------------|-----|----------|---------|
| | h | $^{\circ}$ | $'$ | | |

Idem AC.—Continued

| | | | | | |
|----------|------------|--------|------|---|------------------|
| 1917.226 | 8.6 | 113.1 | 4.57 | 7 | A C. |
| 1918.115 | 7.0 | 113.6 | 4.95 | 7 | |
| .207 | 8.6 | 112.5 | 5.07 | 7 | Good. |
| .210 | 7.5 | 110.8 | 5.16 | 7 | Very Bad seeing. |
| .237 | 8.4 | 111.6 | 5.31 | 7 | Poor seeing. |
| .346 | 11.1 | 109.5 | 5.23 | 7 | |
| 1919.220 | 8.2 | 113.3 | 5.14 | 7 | |
| .237 | 8.5 | 109.6 | 5.26 | 7 | |
| .247 | 8.2 | 110.1 | 5.27 | 7 | Good. |
| .294 | 9.5 | 111.9 | 5.08 | 7 | |
| 1920.240 | 9.2 | 109.6 | 5.42 | 7 | |
| 1890.27 | 2 <i>n</i> | 129.00 | 5.50 | | BC |
| 1893.25 | 1 | 115.7 | 5.45 | | |
| 1894.23 | 3 | 115.83 | 5.32 | | |
| 1895.23 | 3 | 116.57 | 5.24 | | |
| 1896.25 | 4 | 116.45 | 5.28 | | |
| 1897.29 | 4 | 116.05 | 5.27 | | |
| 1898.26 | 4 | 117.08 | 5.38 | | |
| 1899.25 | 4 | 115.38 | 5.35 | | |
| 1901.30 | 4 | 115.28 | 5.44 | | |
| 1902.20 | 5 | 113.40 | 5.43 | | |
| 1903.15 | 4 | 112.40 | 5.40 | | |
| 1904.24 | 3 | 110.90 | 5.47 | | |
| 1906.23 | 4 | 109.12 | 5.43 | | |
| 1907.22 | 4 | 108.40 | 5.26 | | |
| 1908.27 | 3 | 109.00 | 5.12 | | |
| 1909.26 | 3 | 108.27 | 5.09 | | |
| 1910.25 | 3 | 109.40 | 4.85 | | |
| 1912.23 | 3 | 112.30 | 4.67 | | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece | Remarks |
|------|----------|----------|----------|----------|---------|
| | <i>h</i> | <i>°</i> | <i>'</i> | | |

Idem AC.—Continued

| | | | | | |
|---------|---|--------|------|--|--|
| 1914.29 | 3 | 111.87 | 4.89 | | |
| 1915.22 | 3 | 113.20 | 4.95 | | |
| 1916.20 | 4 | 112.15 | 4.92 | | |
| 1917.19 | 4 | 112.52 | 4.94 | | |
| 1918.22 | 5 | 111.60 | 5.14 | | |
| 1919.25 | 4 | 111.17 | 5.19 | | |
| 1920.24 | 1 | 109.6 | 5.42 | | |

 Σ 1216, 45708^h 16.3^m

—1° 16'

6.6 7.6

| | | | | | |
|----------|------|--------|------|-----|------------------------|
| 1910.245 | 9.0 | 206.8 | 0.47 | VII | Separated by glimpses |
| 1914.275 | 9.6 | 217.2 | 0.48 | 9 | Notched. |
| 1915.190 | 8.7 | 213.6 | 0.43 | 7 | Separated. |
| .278 | 9.3 | 214.0 | 0.44 | 7 | Good. |
| 1918.237 | 8.8 | 217.8 | 0.39 | 7 | Difficult, barely sep. |
| .346 | 11.2 | 221.8 | 0.42 | 7 | Not separated. |
| 1894.24 | 4 n | 181.90 | 0.39 | | |
| 1895.47 | 4 | 185.80 | .38 | | |
| 1897.33 | 2 | 195.40 | .40 | | |
| 1898.25 | 2 | 193.15 | .50 | | |
| 1899.26 | 2 | 191.85 | .45 | | |
| 1901.32 | 2 | 192.90 | .54 | | |
| 1902.22 | 2 | 192.00 | .37 | | |
| 1903.21 | 3 | 193.23 | .36 | | |
| 1912.26 | 2 | 212.00 | .48 | | |
| 1915.23 | 2 | 213.80 | .44 | | |
| 1918.29 | 2 | 219.80 | .40 | | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece | Remarks |
|------|----------|----------|----------|----------|---------|
| | <i>h</i> | <i>°</i> | <i>'</i> | | |

ε Hydrae, 4771

8^h 41.5^m

+6° 47'

3.5 ...

| | | | | | |
|----------|------------|--------|-------|---|--------|
| 1915.313 | 10.0 | | | 7 | Round. |
| 1894.28 | 3 <i>n</i> | 192.80 | 0.20 | | |
| 1895.63 | 3 | 220.33 | .17 | | |
| 1899.28 | 2 | 257.30 | .20 | | |
| 1902. | 2 | ? | ? | | |
| 1903.25 | 3 | 317.17 | .25 | | |
| 1915. | 1 | ? | ? | | |

Σ 3121, 5005

9^h 11.9^m

+29° 2'

7.4 7.5

| | | | | | |
|----------|------------|-------|------------------|-----|---|
| 1907.300 | 10.5 | 218.6 | 0.57 | VII | Notched. Notched, Blurred. Slight elongation. |
| .303 | 11.0 | 36.4 | 0.52 | VII | |
| 1908.281 | 10.0 | 37.4 | 0.3 ± | VII | |
| .283 | 9.8 | 216.1 | 0.35 ± | VII | |
| 1909.346 | 10.6 | | | | Separated. |
| 1914.368 | 11.7 | 23.6 | 0.52 | 9 | |
| .374 | 11.5 | 23.9 | 0.49 | 9 | |
| 1916.319 | 10.9 | 29.2 | 0.59 | 7 | |
| .382 | 12.1 | 34.4 | 0.49 | 7 | |
| 1917.212 | 8.5 | 208.1 | 0.51 | 7 | |
| .292 | 11.5 | 212.3 | 0.44 | 7 | |
| .343 | 11.9 | 219.1 | 0.40 | 7 | |
| 1918.237 | 8.6 | 218.1 | 0.46 | 7 | |
| .346 | 11.7 | 221.0 | 0.37 | 7 | |
| .365 | 11.4 | 217.3 | 0.46 | 7 | Notched. Good. Not separated. Sep. by glimpses. |
| 1919.247 | 8.4 | 223.3 | 0.37 | 7 | |
| .278 | 10.4 | 233.6 | 0.35 <i>est.</i> | 7 | |
| .300 | 9.8 | 220.2 | 0.32 | 7 | |
| 1894.00 | 4 <i>n</i> | 4.86 | 0.45 | | |
| 1895.26 | 3 | 8.83 | .50 | | |

| Date | Sid. T. | p | s | Eyepiece | Remarks |
|------|---------|-----|-----|----------|---------|
| | h | ° | ' | | |

 Σ 3121, 5005—Continued

| | | | | | |
|---------|---|-------|------|--|--|
| 1896.24 | 3 | 10.80 | 0.60 | | |
| 1897.34 | 3 | 15.33 | .66 | | |
| 1898.29 | 2 | 16.90 | .70 | | |
| 1899.27 | 3 | 19.10 | .69 | | |
| 1901.30 | 3 | 21.57 | .72 | | |
| 1902.21 | 3 | 23.07 | .78 | | |
| 1903.29 | 3 | 23.23 | .63 | | |
| 1907.30 | 2 | 37.50 | .54 | | |
| 1908.27 | 2 | 36.75 | .32 | | |
| 1914.37 | 2 | 23.75 | .50 | | |
| 1916.35 | 2 | 31.80 | .54 | | |
| 1917.28 | 3 | 33.17 | .45 | | |
| 1918.32 | 3 | 38.80 | .43 | | |
| 1919.28 | 3 | 45.70 | .35 | | |

 Σ 1338, 50309^h 14.5^m

+38° 37'

6.5 7.1

| | | | | | |
|----------|------------|--------|------|-----|--------------|
| 1907.300 | 11.5 | 170.8 | 1.65 | VII | Poor seeing. |
| .303 | 11.3 | 170.4 | 1.61 | VII | |
| 1909.346 | 11.9 | 172.6 | 1.62 | VII | |
| .354 | 12.2 | 171.6 | 1.50 | VII | |
| 1910.426 | 13.1 | 172.2 | 1.49 | VI | |
| 1914.368 | 11.9 | 177.4 | 1.52 | 9 | |
| .374 | 11.7 | 175.5 | 1.48 | 9 | |
| 1894.33 | 2 <i>n</i> | 164.75 | 1.54 | | |
| 1895.33 | 3 | 162.07 | 1.52 | | |
| 1897.31 | 3 | 163.83 | 1.62 | | |
| 1898.30 | 3 | 164.57 | 1.50 | | |

3 Ob

| Date | Sid. T. | p | s | Eyepiece | Remarks |
|------|---------|-----|-----|----------|---------|
| | h | ° | ' | | |

 Σ 1338, 5030—Continued

| | | | | | |
|---------|---|--------|------|--|--|
| 1901.41 | 3 | 165.63 | 1.52 | | |
| 1902.31 | 3 | 166.73 | 1.71 | | |
| 1903.33 | 3 | 167.80 | 1.58 | | |
| 1907.30 | 2 | 170.60 | 1.63 | | |
| 1909.71 | 3 | 172.13 | 1.54 | | |
| 1914.37 | 2 | 176.45 | 1.50 | | |

 ω Leonis, 51039^h 22.9^m

+9° 32'

5.5 6.8

| | | | | | |
|----------|------|-------|------|-----|------------------|
| 1907.300 | 10.2 | 116.1 | 0.88 | VII | |
| .303 | 9.7 | 118.0 | 0.84 | VII | |
| 1908.256 | 9.3 | 119.5 | 0.80 | VII | |
| .261 | 10.2 | 119.5 | 0.86 | VII | |
| 1909.346 | 10.9 | 121.8 | 0.88 | VII | |
| .354 | 12.4 | 119.9 | 0.85 | VII | |
| 1910.401 | 12.9 | 119.9 | 0.71 | VII | |
| .426 | 13.2 | 123.1 | 0.62 | VI | |
| 1912.242 | 9.1 | 119.3 | 0.91 | VII | Very blurred. |
| 1914.275 | 9.8 | 123.3 | 0.97 | 9 | Good. |
| .368 | 12.1 | 123.3 | 0.95 | 9 | |
| 1915.310 | 10.2 | 122.8 | 0.92 | 9 | |
| .313 | 9.8 | 125.2 | 0.85 | 7 | |
| 1916.185 | 8.7 | 129.2 | 0.89 | 9 | |
| .223 | 7.8 | 127.5 | 0.83 | 12 | |
| .267 | 9.1 | 126.9 | 0.85 | 12 | Very bad. |
| 1917.163 | 6.9 | 130.5 | 0.74 | 7 | Very bad seeing. |
| .164 | 6.8 | 130.2 | 0.76 | 7 | |
| .212 | 8.3 | 127.9 | 0.84 | 7 | |

| Date | Sid. T. | p | s | Eyepiece | Remarks |
|------|---------|-----|-----|----------|---------|
| | h | ° | ' | | |

 ω Leonis, 5103—Continued

| | | | | | |
|----------|------|--------|------|---|------------------|
| 1917.286 | 9.5 | 126.3 | 0.78 | 7 | Bad seeing. |
| 1918.237 | 9.2 | 130.1 | 1.14 | 7 | Blurred. |
| .289 | 9.5 | 132.4 | 0.96 | 7 | Poor seeing. |
| .338 | 11.0 | 126.4 | 0.91 | 7 | Very bad seeing. |
| 1919.220 | 8.6 | 131.1 | 0.98 | 7 | Poor seeing. |
| .237 | 9.0 | 131.7 | 0.90 | 7 | Poor seeing. |
| .278 | 9.7 | 132.3 | 0.99 | 7 | |
| 1890.27 | 2 n | 101.80 | 0.68 | | |
| 1893.98 | 4 | 104.78 | .67 | | |
| 1895.24 | 3 | 106.10 | .67 | | |
| 1896.29 | 4 | 107.25 | .69 | | |
| 1897.29 | 4 | 108.87 | .82 | | |
| 1898.27 | 3 | 109.17 | .74 | | |
| 1899.27 | 3 | 110.50 | .80 | | |
| 1901.31 | 4 | 114.15 | .81 | | |
| 1902.24 | 3 | 114.03 | .92 | | |
| 1903.23 | 3 | 116.83 | .98 | | |
| 1906.96 | 3 | 117.30 | .85 | | |
| 1908.26 | 2 | 119.50 | .83 | | |
| 1909.35 | 2 | 120.85 | .86 | | |
| 1911.03 | 3 | 120.77 | .75 | | |
| 1914.32 | 2 | 123.30 | .96 | | |
| 1915.31 | 2 | 124.00 | .88 | | |
| 1916.22 | 3 | 127.87 | .86 | | |
| 1917.10 | 4 | 128.72 | .78 | | |
| 1918.29 | 3 | 129.63 | 1.00 | | |
| 1919.24 | 3 | 131.70 | .96 | | |

| Date | Sid. T. | p | s | Eye-piece | Remarks |
|------|---------|-----|-----|-----------|---------|
| h | ° | " | | | |

 ϕ Ursae Majoris, 52239^h 45.3^m

+54° 32'

4.5 6.3

| | | | | | |
|----------|------|--------|------|---|-------------|
| 1914.456 | 13.7 | 313.6 | 0.42 | 7 | Separated. |
| .461 | 15.0 | 310.6 | 0.50 | 7 | Blurred. |
| 1917.352 | 11.3 | 315.8 | 0.40 | 7 | Separated. |
| .363 | 12.4 | 314.5 | 0.43 | 7 | Separated. |
| .365 | 11.2 | 319.6 | 0.43 | 7 | |
| 1919.247 | 8.8 | 319.8 | 0.50 | 7 | |
| .300 | 11.7 | 320.5 | 0.56 | 7 | Bad seeing. |
| 1892. | 2 n | ? | ? | | |
| 1897.40 | 3 | 276.07 | 0.30 | | |
| 1898.28 | 2 | 280.65 | .30 | | |
| 1899.28 | 2 | 276.90 | .32 | | |
| 1901.42 | 3 | 283.63 | .36 | | |
| 1902.31 | 2 | 287.80 | .35 | | |
| 1903.33 | 3 | 290.63 | .30 | | |
| 1914.46 | 2 | 312.10 | .46 | | |
| 1917.36 | 3 | 316.67 | .42 | | |
| 1919.27 | 2 | 320.15 | .53 | | |

8 Sextantis, 5235

9^h 47.5^m

-7° 38'

6.3 6.8

| | | | | | |
|----------|------|-------|------|-----|-------------|
| 1907.300 | 10.7 | 76.2 | 0.55 | VII | |
| .303 | 9.9 | 256.6 | 0.50 | VII | Blurred. |
| 1908.261 | 10.4 | 73.4 | 0.58 | VII | |
| 1915.278 | 9.5 | 68.4 | 0.53 | 7 | |
| .310 | 10.5 | 65.6 | 0.53 | 7 | Bad seeing. |
| .313 | 10.2 | 66.4 | 0.64 | 7 | |
| 1916.319 | 11.2 | 66.4 | 0.62 | 7 | |

| Date | Sid. T. | p | s | Eyepiece | Remarks |
|------|---------|---------|----------|----------|---------|
| | h | \circ | \prime | | |

8 Sextantis, 5235—Continued

| | | | | | |
|----------|------|--------|------|---|------------------|
| 1916.346 | 10.9 | 68.1 | 0.59 | 7 | Bad seeing. |
| 1917.292 | 9.8 | 62.2 | 0.53 | 7 | |
| .343 | 12.1 | 57.7 | 0.50 | 7 | Very blurred. |
| .346 | 11.4 | 62.7 | 0.43 | 7 | |
| 1918.346 | 11.4 | 60.6 | 0.51 | 7 | Very blurred. |
| .357 | 11.2 | 62.9 | 0.52 | 7 | Blurred. |
| .365 | 11.6 | 63.2 | 0.54 | 7 | |
| 1919.247 | 8.8 | 62.7 | 0.53 | 7 | |
| .278 | 10.7 | 65.3 | 0.54 | 7 | Very bad seeing. |
| .300 | 10.0 | 65.1 | 0.57 | 7 | |
| 1894.25 | 3 n | 102.23 | 0.32 | | |
| 1895.31 | 3 | 98.63 | .39 | | |
| 1896.26 | 2 | 96.15 | .37 | | |
| 1897.33 | 2 | 94.80 | .37 | | |
| 1898.29 | 4 | 92.98 | .42 | | |
| 1899.28 | 2 | 87.10 | .43 | | |
| 1901.35 | 4 | 86.92 | .47 | | |
| 1902.33 | 2 | 85.10 | .48 | | |
| 1903.21 | 3 | 80.90 | .47 | | |
| 1907.28 | 4 | 75.95 | .56 | | |
| 1915.30 | 3 | 66.80 | .57 | | |
| 1916.33 | 2 | 67.25 | .60 | | |
| 1917.33 | 3 | 60.87 | .49 | | |
| 1918.36 | 3 | 62.23 | .52 | | |
| 1919.28 | 3 | 64.37 | .55 | | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece | Remarks |
|------|----------|----------|----------|----------|---------|
| | <i>h</i> | <i>°</i> | <i>'</i> | | |

O Σ 215, 536510^h 10.8^m

+18° 14'

7.0 7.5

| | | | | | |
|----------|------------|--------|------|-----|--|
| 1907.300 | 10.9 | 205.0 | 1.02 | VII | |
| 1908.261 | 10.6 | 201.8 | 0.91 | VII | |
| 1909.354 | 12.6 | 204.8 | 0.84 | VII | |
| .384 | 12.2 | 203.9 | 0.74 | VII | |
| 1914.368 | 12.2 | 203.9 | 0.94 | 9 | |
| .374 | 11.9 | 201.9 | 0.93 | 9 | |
| 1890.27 | 2 <i>n</i> | 213.60 | 0.74 | | |
| 1892.48 | 2 | 214.95 | .67 | | |
| 1893.72 | 2 | 210.00 | .68 | | |
| 1902.27 | 3 | 204.67 | .97 | | |
| 1903.29 | 3 | 205.57 | .80 | | |
| 1907.28 | 3 | 204.20 | .90 | | |
| 1909.37 | 2 | 204.35 | .79 | | |
| 1914.37 | 2 | 202.90 | .94 | | |

 γ Leonis, 538810^h 14.1^m

+20° 22'

2.6 3.8

| | | | | | |
|----------|------------|--------|------|----|--|
| 1908.354 | 11.8 | 115.0 | 3.91 | VI | |
| .480 | 15.4 | 115.2 | 3.80 | X | |
| 1909.374 | 12.3 | 114.9 | 3.85 | X | |
| .384 | 12.0 | 116.8 | 3.90 | V | |
| 1912.459 | 13.1 | 115.3 | 3.71 | V | |
| 1913.415 | 12.3 | 114.7 | 3.72 | X | |
| 1915.352 | 12.8 | 117.0 | 4.05 | 12 | |
| .355 | 13.8 | 119.8 | 4.00 | 12 | |
| 1890.27 | 2 <i>n</i> | 114.50 | 3.36 | | |
| 1892.47 | 4 | 114.58 | 3.43 | | |

| Date | Sid. T. | p | s | Eyepiece | Remarks |
|------|---------|-----|-----|----------|---------|
| | h | ° | " | | |

 γ Leonis, 5388—Continued

| | | | | | |
|---------|---|--------|------|--|--|
| 1894.32 | 3 | 114.83 | 3.33 | | |
| 1895.33 | 3 | 115.80 | 3.61 | | |
| 1896.26 | 3 | 115.40 | 3.58 | | |
| 1902.44 | 2 | 115.20 | 3.68 | | |
| 1903.32 | 3 | 114.53 | 3.71 | | |
| 1904.42 | 2 | 118.90 | 4.12 | | |
| 1908.42 | 2 | 115.10 | 3.86 | | |
| 1909.38 | 2 | 115.75 | 3.92 | | |
| 1912.94 | 2 | 115.00 | 3.72 | | |
| 1915.35 | 2 | 118.40 | 4.02 | | |

 $\text{O}\Sigma$ 216, 540910^h 17.4^m

+15° 52'

7.4 11.3

| | | | | | |
|----------|------|--------|------|----|------------|
| 1907.300 | 11.1 | 100.4 | 1.10 | VI | |
| 1908.261 | 10.9 | 105.2 | 1.16 | VI | Difficult. |
| 1914.368 | 12.7 | 90.2 | 0.96 | V | Difficult. |
| .374 | 12.1 | 87.1 | 1.23 | 9 | Difficult. |
| 1915.278 | 9.7 | 87.4 | 0.96 | 12 | Difficult. |
| .310 | 10.8 | 87.6 | 1.03 | 12 | Difficult. |
| 1916.319 | 11.3 | 89.2 | 0.99 | 12 | |
| .382 | 12.5 | 89.8 | 1.02 | 9 | |
| 1917.292 | 10.1 | 92.5 | 1.15 | 12 | |
| 1902.33 | 2 n | 113.15 | 1.23 | | |
| 1903.27 | 3 | 113.20 | 1.11 | | |
| 1907.28 | 3 | 103.20 | 1.24 | | |
| 1914.37 | 2 | 88.65 | 1.10 | | |
| 1915.29 | 2 | 87.50 | 1.00 | | |
| 1916.66 | 3 | 90.50 | 1.05 | | |

| Date | Sid. T. | p | s | Eyepiece | Remarks |
|------|---------|-----|-----|----------|---------|
| | h | ° | " | | |

O Σ 224, 551510^h 34.5^m

+9° 22'

7.9 9.1

| | | | | | |
|----------|------|--------|------------------|---------------|-----------------------|
| 1907.300 | 11.2 | 287.5 | 0.50 | VII | |
| 1908.261 | 11.4 | 284.4 | 0.61 | VII | |
| 1909.384 | | | Suspect | elongation in | 270°. |
| 1914.368 | 12.9 | 278.7 | 0.52 | 9 | |
| .389 | 12.1 | 279.5 | 0.41 | 7 | Sep. by glimpses. |
| 1915.278 | 10.2 | 277.6 | 0.55 | 7 | Bad seeing. |
| .313 | 10.1 | 275.3 | 0.40 | 7 | |
| 1916.319 | 11.6 | 277.4 | 0.57 | 7 | |
| .382 | 12.3 | 273.9 | 0.42 | 7 | |
| 1917.343 | 12.4 | 271.4 | 0.35 | 7 | Separated. |
| .346 | 11.7 | 276.1 | 0.39 | 7 | Separated. |
| 1918.346 | 11.9 | 274.1 | 0.38 | 7 | |
| .357 | 11.4 | 274.0 | 0.35 <i>est.</i> | 7 | Not separated. |
| .365 | 11.8 | 273.5 | 0.44 | 7 | Sep. with difficulty. |
| 1919.247 | 9.0 | 276.3 | 0.39 | 7 | Difficult. |
| .300 | 10.2 | 274.0 | 0.41 | 7 | |
| 1894.24 | 3 n | 312.73 | 0.43 | | |
| 1895.52 | 4 | 309.87 | .41 | | |
| 1897.33 | 3 | 309.10 | .44 | | |
| 1902.02 | 3 | 297.57 | .49 | | |
| 1903.26 | 3 | 304.27 | .32 | | |
| 1907.78 | 2 | 285.95 | .56 | | |
| 1914.38 | 2 | 279.10 | .46 | | |
| 1915.30 | 2 | 276.45 | .48 | | |
| 1916.35 | 2 | 275.65 | .50 | | |
| 1917.34 | 2 | 273.75 | .37 | | |
| 1918.36 | 3 | 273.87 | .39 | | |
| 1919.27 | 2 | 275.15 | .40 | | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece | Remarks |
|------|----------|----------|----------|-----------|---------|
| | <i>h</i> | <i>°</i> | <i>"</i> | | |

 α Ursae Majoris, 565210^h 57.6^m

+62° 17'

2.0 ...

| | | | | | |
|----------|------------|--------|----------|----------|--------------------|
| 1908.256 | 10.0 | | | | Single visible. |
| 1915.352 | 12.5 | ..... | Blurred. | No comes | |
| 1895.25 | 2 <i>n</i> | 305.50 | 0.85 | | |
| 1896.30 | 2 | 301.40 | .84 | | |
| 1898.25 | 2 | 293.55 | .89 | | |
| 1899.37 | 3 | 283.40 | .84 | | |
| 1903.32 | 1 | 272.10 | .60 | | |
| 1908. | 1 | ? | ? | | |
| 1915. | 1 | ? | ? | | |

 Σ 1517, 570711^h 8.5^m

+20° 42'

6.9 ...

| | | | | | |
|----------|------|--------|------------------|-----|----------------------|
| 1909.384 | 13.3 | 263.5 | 0.25 <i>est.</i> | VII | Elongated. |
| .464 | 14.1 | 264.1 | 0.42 | VII | Notched. |
| 1913.423 | 14.1 | 262.0 | 0.30 <i>est.</i> | VI | Elongated. |
| 1914.374 | 12.8 | 260. = | 0.35 <i>est.</i> | 9 | |
| .456 | 14.0 | 260.0 | 0.29 | 7 | |
| 1915.278 | 10.0 | 262.4 | 0.25 <i>est.</i> | 7 | Elongated. |
| .352 | 12.4 | 263.1 | 0.33 | 7 | Elongated. |
| 1916.319 | 12.2 | 260.0 | 0.35 <i>est.</i> | 7 | Wedge. |
| .382 | 12.7 | 265.2 | 0.30 <i>est.</i> | 7 | Elongated. |
| 1917.292 | 10.4 | 262.1 | 0.35 <i>est.</i> | 7 | Elongated. |
| .343 | 12.5 | 257.1 | 0.30 <i>est.</i> | 7 | Elongated. |
| .390 | 13.4 | 258.1 | 0.30 <i>est.</i> | 7 | Elongated. |
| 1918.346 | 12.0 | ..... | ..... |  | Cannot. |
| .365 | 12.0 | 259.6 | 0.30 <i>est.</i> | 7 | Elongated. Difficult |
| .431 | 13.0 | 261.2 | 0.35 <i>est.</i> | 7 | Elongated. |

| Date | Sid. T. | p | s | Eye-piece | Remarks |
|------|---------|-----|-----|-----------|---------|
| | h | ° | " | | |

 Σ 1517, 5707—Continued

| | | | | | |
|----------|------------|--------|------------------|---|----------------------|
| 1919.247 | 9.1 | ..... | .... |  | Cannot. |
| .300 | 10.5 | 260.6 | 0.25 <i>est.</i> | 7 | Trifling elongation. |
| 1894.25 | 3 <i>n</i> | 278.03 | 0.48 | | |
| 1895.56 | 4 | 274.65 | .38 | | |
| 1897.32 | 2 | 273.55 | .49 | | |
| 1898.55 | 4 | 272.82 | .47 | | |
| 1901.37 | 3 | 273.03 | .45 | | |
| 1902.33 | 2 | 271.07 | .46 | | |
| 1903.27 | 3 | 269.63 | .36 | | |
| 1906.49 | 1 | 252.7 | .25 | | |
| 1909.42 | 2 | 263.80 | .34 | | |
| 1914.08 | 3 | 260.77 | .31 | | |
| 1915.31 | 2 | 262.85 | .29 | | |
| 1916.35 | 2 | 262.60 | .32 | | |
| 1917.34 | 3 | 259.10 | .32 | | |
| 1918.39 | 2 | 260.40 | .32 | | |
| 1919.30 | 1 | 260.6 | .25 | | |

 ξ Ursae Majoris, 573411^h 12.9^m

+32° 6'

4.4 4.9

| | | | | | |
|----------|------|-------|------|-----|--|
| 1907.300 | 11.7 | 128.4 | 2.61 | VII | |
| .303 | 10.1 | 131.5 | 3.09 | III | |
| .483 | 14.8 | 129.4 | 2.73 | VI | |
| 1908.256 | 9.6 | 129.7 | 2.89 | V | |
| .261 | 11.2 | 128.8 | 2.93 | VI | |
| .445 | 15.7 | 128.8 | 2.76 | III | |
| 1909.374 | 12.7 | 125.3 | 2.87 | III | |
| .384 | 12.5 | 125.8 | 2.77 | VII | |
| .423 | 13.7 | 125.0 | 2.77 | III | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece | Remarks |
|------|---------|----------|----------|----------|---------|
| | h | ° | " | | |

ξ Ursae Majoris, 5734—Continued

| | | | | | |
|----------|------|--------|------|----|----------|
| 1912.242 | 9.3 | 121.3 | 3.06 | VI | Blasing. |
| .459 | 13.3 | 118.7 | 2.79 | VI | |
| 1913.415 | 12.8 | 297.4 | 2.93 | VI | |
| .423 | 13.9 | 117.8 | 3.05 | VI | |
| 1914.374 | 12.3 | 114.4 | 3.02 | 9 | |
| .379 | 12.0 | 115.7 | 2.84 | 12 | |
| .389 | 11.8 | 115.2 | 3.03 | 12 | |
| 1915.352 | 10.7 | 114.6 | 3.14 | 12 | |
| .409 | 12.7 | 114.2 | 3.03 | 12 | |
| .411 | 12.7 | 115.0 | 2.92 | 12 | |
| 1916.185 | 9.0 | 112.1 | 3.05 | 12 | |
| .338 | 12.8 | 111.0 | 3.06 | 12 | |
| .382 | 13.3 | 109.5 | 2.92 | 7 | |
| 1917.164 | 8.6 | 112.2 | 3.26 | 12 | |
| .212 | 9.0 | 112.7 | 3.17 | 7 | |
| .234 | 8.6 | 110.1 | 3.01 | 12 | |
| .275 | 9.7 | 111.4 | 2.88 | 7 | |
| 1918.237 | 9.5 | 109.4 | 2.94 | 12 | |
| .357 | 12.2 | 107.4 | 2.95 | 7 | |
| .417 | 12.8 | 104.0 | 2.86 | 9 | |
| 1919.220 | 8.8 | 107.9 | 3.32 | V | |
| .245 | 8.8 | 106.7 | 3.06 | V | |
| .294 | 9.8 | 107.0 | 2.84 | 7 | |
| 1892.47 | 4 n | 197.52 | 1.57 | | |
| 1894.22 | 3 | 183.20 | 1.79 | | |
| 1895.30 | 3 | 176.47 | 1.93 | | |
| 1896.27 | 4 | 171.15 | 1.92 | | |
| 1897.38 | 3 | 164.43 | 2.03 | | |
| 1898.27 | 3 | 160.87 | 2.05 | | |

| Date | Sid. T. | p | s | Eyepiece | Remarks |
|------|---------|-----|-----|----------|---------|
| | h | ° | " | | |

ξ Ursae Majoris, 5734—Continued

| | | | | | |
|---------|---|--------|------|--|--|
| 1899.28 | 2 | 156.10 | 2.16 | | |
| 1901.37 | 5 | 147.34 | 2.38 | | |
| 1902.43 | 4 | 144.20 | 2.42 | | |
| 1903.29 | 3 | 144.07 | 2.51 | | |
| 1904.56 | 3 | 136.97 | 2.64 | | |
| 1906.46 | 5 | 132.98 | 2.57 | | |
| 1907.36 | 3 | 129.77 | 2.81 | | |
| 1908.32 | 3 | 129.10 | 2.86 | | |
| 1909.39 | 3 | 125.37 | 2.80 | | |
| 1912.35 | 2 | 120.00 | 2.93 | | |
| 1913.42 | 2 | 117.60 | 2.99 | | |
| 1914.38 | 3 | 115.10 | 2.96 | | |
| 1915.39 | 3 | 114.60 | 3.03 | | |
| 1916.30 | 3 | 110.87 | 3.01 | | |
| 1917.22 | 4 | 111.60 | 3.08 | | |
| 1918.34 | 3 | 106.93 | 2.92 | | |
| 1919.25 | 3 | 107.20 | 3.07 | | |

Σ 1536, 5765

11 h 18.7^m

+11° 5'

4.0 7.7

| | | | | | |
|----------|------|------|------|----|--|
| 1916.319 | 11.8 | 43.6 | 2.02 | 12 | |
| .338 | 12.6 | 41.4 | 2.01 | 12 | |
| .341 | 10.8 | 42.4 | 2.18 | 12 | |
| 1917.164 | 8.9 | 41.1 | 2.43 | 12 | |
| .212 | 9.2 | 44.4 | 1.74 | V | |
| .234 | 8.9 | 44.5 | 2.04 | 12 | |
| .275 | 9.9 | 42.6 | 1.87 | 9 | |
| 1918.237 | 9.7 | 42.2 | 1.75 | 9 | |

| Date | Sid. T. | p | s | Eye-piece | Remarks |
|------|---------|-----|-----|-----------|---------|
| | h | ° | " | | |

 Σ 1536, 5765—Continued

| | | | | | |
|----------|------|-------|------|---|------------------|
| 1918.346 | 12.2 | 39.3 | 1.81 | 7 | |
| .357 | 11.7 | 41.2 | 1.60 | 7 | |
| 1919.237 | 9.3 | 35.9 | 1.81 | 7 | Through clouds |
| .245 | 9.1 | 38.3 | 1.98 | 9 | Very bad seeing. |
| .294 | 10.0 | 42.5 | 1.69 | V | Very bad seeing. |
| .374 | 11.6 | 4.12 | 1.81 | 7 | Bad seeing. |
| 1916.33 | 3 n | 42.47 | 2.07 | | |
| 1917.22 | 4 | 43.25 | 2.02 | | |
| 1918.31 | 3 | 40.90 | 1.72 | | |
| 1919.29 | 4 | 39.47 | 1.82 | | |

O Σ 234, 580511^h 25.4^m

+41° 50'

7.0 7.8

| | | | | | |
|----------|------|-------|------|---|-------------------|
| 1914.437 | 14.1 | 159.0 | 0.44 | 7 | |
| .456 | 14.2 | 159.6 | 0.43 | 7 | |
| 1915.409 | 14.0 | 164.1 | 0.52 | 7 | |
| .508 | 15.3 | 161.2 | 0.51 | 7 | |
| 1916.382 | 13.6 | 164.1 | 0.47 | 7 | Barely separated. |
| .445 | 15.6 | 162.1 | 0.53 | 9 | Separated. |
| .516 | 15.4 | 160.7 | 0.52 | 7 | |
| 1917.390 | 13.6 | 166.1 | 0.49 | 7 | |
| .401 | 13.7 | 170.3 | 0.49 | 7 | Sep. by glimpses. |
| .404 | 14.3 | 161.9 | 0.63 | 9 | |
| 1918.431 | 13.5 | 163.6 | 0.47 | 7 | |
| .442 | 13.6 | 163.5 | 0.45 | 7 | |
| .475 | 14.5 | 164.0 | 0.50 | 7 | |
| 1919.313 | 9.9 | 166.4 | 0.45 | 7 | Not separated. |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece | Remarks |
|------|---------|----------|----------|-----------|---------|
| | h | ° | " | | |

O Σ 234, 5805—Continued

| | | | | | |
|----------|------|--------|------|---|---------------|
| 1919.510 | 16.1 | 173.6 | 0.56 | 7 | Very blurred. |
| .521 | 15.8 | 163.7 | 0.47 | 7 | Blurred. |
| 1893. | 5 n | ? | ? | | |
| 1894.60 | 3 | 122.90 | 0.25 | | |
| 1898.03 | 3 | 130.63 | .30 | | |
| 1901.45 | 3 | 140.77 | .45 | | |
| 1902.42 | 2 | 142.00 | .30 | | |
| 1903.29 | 2 | 144.55 | .42 | | |
| 1914.45 | 2 | 159.30 | .44 | | |
| 1915.46 | 2 | 162.65 | .52 | | |
| 1916.45 | 3 | 162.30 | .51 | | |
| 1917.40 | 3 | 166.10 | .54 | | |
| 1918.45 | 3 | 163.70 | .47 | | |
| 1919.45 | 3 | 167.90 | .49 | | |

O Σ 235, 581111^h 26.7^m

+61° 38'

5.5 7.9

| | | | | | |
|----------|------|-------|------|---|-------------|
| 1914.437 | 14.3 | 269.0 | 0.55 | 7 | |
| .456 | 14.6 | 267.4 | 0.55 | 7 | |
| 1915.409 | 13.0 | 267.2 | 0.52 | 7 | Good. |
| .411 | 13.0 | 267.5 | 0.50 | 7 | Blurred. |
| 1916.516 | 15.3 | 285.1 | 0.55 | 7 | |
| .521 | 15.6 | 285.0 | 0.49 | 7 | Bad seeing. |
| 1917.390 | 13.8 | 277.7 | 0.63 | 7 | Very bad. |
| .396 | 12.5 | 290.8 | 0.52 | 7 | Bad seeing. |
| .401 | 13.5 | 285.0 | 0.54 | 7 | Blurred. |
| 1918.431 | 13.2 | 294.0 | 0.49 | 7 | |
| .442 | 13.3 | 292.3 | 0.43 | 7 | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece | Remarks |
|------|---------|----------|----------|----------|---------|
| | h | ° | " | | |

O Σ 235, 5811—Continued

| | | | | | |
|----------|------|--------|------|---|------------------|
| 1918.475 | 14.2 | 297.8 | 0.46 | 7 | Very bad seeing. |
| 1919.313 | 9.7 | 301.0 | 0.54 | 7 | Blurred. |
| .510 | 16.3 | 302.4 | 0.59 | 7 | Very bad seeing. |
| .521 | 15.6 | 300.5 | 0.52 | 7 | |
| 1892.54 | 3 n | 84.20 | 0.90 | | |
| 1894.03 | 4 | 90.12 | .79 | | |
| 1895.27 | 3 | 93.87 | .79 | | |
| 1896.29 | 4 | 97.78 | .70 | | |
| 1897.61 | 4 | 101.78 | .78 | | |
| 1899.38 | 3 | 108.03 | .58 | | |
| 1901.41 | 4 | 126.18 | .52 | | |
| 1903.01 | 3 | 138.10 | .41 | | |
| 1906.25 | 1 | ? | ? | | |
| 1914.45 | 2 | 268.20 | .55 | | |
| 1915.41 | 2 | 267.35 | .51 | | |
| 1916.52 | 2 | 285.05 | .52 | | |
| 1917.40 | 3 | 284.50 | .56 | | |
| 1918.45 | 3 | 294.70 | .46 | | |
| 1919.45 | 3 | 301.30 | .55 | | |

 β 456, 584811^h 31.8^m

—11° 47'

9.3 10.

| | | | | | |
|----------|------|--------|------------------|---|----------------------|
| 1915.352 | 11.6 | 19.2 | 0.30 <i>est.</i> | 7 | Notched. |
| .409 | 13.2 | 28.4 | 0.30 <i>est.</i> | 7 | Doubtful separation. |
| 1917.343 | 12.8 | 30. | 0.2 | | Estimated. |
| 1894.80 | 2 n | 274.20 | 0.28 | | |
| 1898.29 | 2 | 292.95 | .25 | | |
| 1903. | 3 | ? | ? | | |
| 1916.03 | 3 | 29.30 | .27 | | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece | Remarks |
|-----------------------------------|---------|----------|----------|-----------|----------------------|
| | h | ° | " | | |
| Σ 1639, 6158 | | | | | |
| 12 ^h 19.5 ^m | | | +26° 8' | | 6.3 7.9 |
| 1914.437 | 13.8 | 344.0 | 0.53 | 7 | |
| .461 | 14.7 | 339.7 | 0.58 | 9 | |
| 1915.352 | 11.4 | 342.6 | 0.52 | 7 | |
| .355 | 11.0 | 344.0 | 0.64 | 7 | Blurred. |
| 1916.382 | 13.9 | 344.3 | 0.70 | 7 | Very bad seeing. |
| .412 | 12.6 | 344.4 | 0.71 | 7 | Very blurred. |
| .445 | 15.4 | 341.9 | 0.70 | 9 | |
| 1917.212 | 9.4 | 334.9 | 0.55 | 7 | Very unsatisfactory. |
| .292 | 10.6 | 341.6 | 0.68 | 7 | |
| .343 | 13.0 | 343.2 | 0.66 | 7 | |
| .349 | 11.5 | 341.6 | 0.58 | 7 | |
| 1918.237 | 9.9 | 338.4 | 0.65 | 7 | |
| .346 | 12.3 | 343.8 | 0.54 | 7 | |
| .357 | 12.5 | 345.3 | 0.53 | 7 | |
| 1919.247 | 9.3 | 340.0 | 0.76 | 7 | |
| .300 | 10.9 | 339.7 | 0.75 | 7 | |
| .306 | 10.7 | 338.9 | 0.74 | 7 | |
| .374 | 11.8 | 343.0 | 0.58 | 7 | |
| 1899.12 | 3 n | 2.90 | 0.28 | | |
| 1902. | 4 | ? | ? | | |
| 1914.45 | 2 | 341.85 | .56 | | |
| 1915.35 | 2 | 343.30 | .58 | | |
| 1916.41 | 3 | 343.53 | .70 | | |
| 1917.30 | 4 | 342.82 | .62 | | |
| 1918.45 | 3 | 342.50 | .57 | | |
| 1919.31 | 4 | 340.40 | .71 | | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece | Remarks |
|---|------------|----------|----------|-----------|------------------|
| | <i>h</i> | <i>°</i> | <i>"</i> | | |
| γ Virginis, 6243 12 ^h 36.6 ^m —0° 54' 3.7 3.9 | | | | | |
| 1908.480 | 15.2 | 323.1 | 5.79 | X | Blurred. |
| .483 | 14.6 | 328.8 | 5.93 | X | Good. |
| .491 | 14.8 | 327.2 | 5.87 | V | |
| 1912.459 | 13.5 | 323.8 | 6.01 | VI | |
| .472 | 14.5 | 322.8 | 5.71 | VI | |
| 1914.456 | 13.5 | 323.6 | 6.10 | 9 | |
| .461 | 14.4 | 322.7 | 5.81 | V | |
| .464 | 13.9 | 321.7 | 5.91 | 12 | Blurred. |
| 1915.352 | 10.9 | 323.3 | 5.99 | 12 | |
| .355 | 10.8 | 324.8 | 6.11 | 12 | |
| .360 | 11.4 | 324.6 | 6.01 | 12 | |
| 1916.319 | 12.6 | 325.1 | 6.14 | 7 | Very blurred. |
| .341 | 10.5 | 324.5 | 5.91 | 12 | |
| .357 | 11.2 | 324.1 | 6.29 | 12 | Very bad seeing. |
| .409 | 12.5 | 325.6 | 6.09 | 9 | Blurred. |
| 1917.363 | 12.9 | 323.6 | 6.07 | 7 | Good. |
| .365 | 12.3 | 323.1 | 6.05 | 7 | |
| .368 | 11.5 | 325.0 | 5.93 | 7 | |
| .401 | 12.2 | 325.0 | 5.88 | 9 | |
| 1918.365 | 12.2 | 321.3 | 6.10 | 7 | |
| .387 | 11.5 | 324.1 | 6.07 | 12 | |
| .412 | 12.1 | 324.7 | 5.95 | 7 | |
| .417 | 12.5 | 323.3 | 5.99 | 7 | Bad seeing. |
| 1919.313 | 10.7 | 324.3 | 6.02 | 7 | Blasing. |
| .374 | 12.0 | 323.7 | 6.02 | V | |
| .379 | 11.6 | 326.0 | 6.26 | V | Very bad seeing. |
| .396 | 12.3 | 323.2 | 5.97 | 7 | Good. |
| 1892.49 | 3 <i>n</i> | 333.57 | 5.55 | | |
| 1894.07 Ob 4 | 3 | 332.43 | 5.55 | | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece | Remarks |
|------|----------|----------|----------|----------|---------|
| | <i>h</i> | <i>°</i> | <i>"</i> | | |

 γ Virginis, 6243—Continued

| | | | | | |
|---------|---|--------|------|--|--|
| 1895.43 | 3 | 332.03 | 5.65 | | |
| 1896.36 | 3 | 331.67 | 5.55 | | |
| 1897.47 | 3 | 329.06 | 5.63 | | |
| 1898.36 | 2 | 331.15 | 5.92 | | |
| 1899.50 | 3 | 328.63 | 5.82 | | |
| 1901.37 | 5 | 330.28 | 5.87 | | |
| 1902.45 | 3 | 328.77 | 5.82 | | |
| 1903.36 | 3 | 329.40 | 5.87 | | |
| 1904.48 | 3 | 330.07 | 5.71 | | |
| 1906.50 | 3 | 328.07 | 5.84 | | |
| 1908.48 | 3 | 326.37 | 5.86 | | |
| 1912.47 | 2 | 323.30 | 5.86 | | |
| 1914.46 | 3 | 322.67 | 5.94 | | |
| 1915.36 | 3 | 324.23 | 6.04 | | |
| 1916.36 | 4 | 324.82 | 6.11 | | |
| 1917.38 | 4 | 324.17 | 5.98 | | |
| 1918.40 | 4 | 323.35 | 6.03 | | |
| 1919.37 | 4 | 324.30 | 6.07 | | |

O Σ 256, 631212^h 51.3^m

—0° 25'

6.6 6.8

| | | | | | |
|----------|------|-------|------|-----|----------|
| 1908.491 | 15.1 | 255.6 | 0.70 | VI | Blurred. |
| .519 | 15.6 | 73.9 | 0.72 | VI | |
| 1909.374 | 13.0 | 77.4 | 0.66 | VII | |
| .384 | 12.9 | 76.4 | 0.74 | VII | |
| 1910.546 | 16.0 | 77.3 | 0.67 | VII | |
| 1912.437 | 14.7 | 80.4 | 0.73 | VII | |
| .459 | 13.7 | 77.7 | 0.60 | VI | |
| .472 | 14.7 | 76.5 | 0.72 | VI | |

| Date | Sid. T. | p | s | Eye-piece | Remarks |
|--------------------------------|---------|-------|------|-----------|--------------|
| | h | ° | " | | |
| O Σ 256, 6312—Continued | | | | | |
| 1914.374 | 12.7 | 80.2 | 0.72 | 9 | |
| .389 | 12.3 | 77.9 | 0.60 | 7 | |
| 1915.352 | 11.1 | 79.2 | 0.66 | 9 | |
| .409 | 13.4 | 79.9 | 0.65 | 7 | |
| 1916.319 | 12.4 | 77.9 | 0.67 | 7 | |
| .390 | 12.2 | 78.2 | 0.58 | 7 | Good. |
| 1917.292 | 10.8 | 79.7 | 0.53 | 7 | |
| .343 | 12.7 | 79.2 | 0.63 | 7 | Good. |
| .346 | 12.1 | 78.4 | 0.61 | 7 | |
| 1918.346 | 12.6 | 82.3 | 0.59 | 7 | Poor seeing. |
| .357 | 12.6 | 79.8 | 0.52 | 7 | |
| .365 | 12.4 | 79.8 | 0.66 | 7 | |
| 1919.300 | 11.4 | 78.4 | 0.74 | 7 | |
| .305 | 11.2 | 80.2 | 0.64 | 7 | |
| .374 | 12.2 | 81.1 | 0.58 | 7 | |
| 1894.40 | 2 n | 73.75 | 0.52 | | |
| 1895.40 | 3 | 73.90 | .58 | | |
| 1902.39 | 3 | 74.00 | .59 | | |
| 1903.33 | 3 | 73.50 | .62 | | |
| 1906.50 | 2 | 74.70 | .62 | | |
| 1908.50 | 2 | 74.75 | .71 | | |
| 1909.77 | 3 | 77.03 | .69 | | |
| 1912.46 | 3 | 78.20 | .68 | | |
| 1914.38 | 2 | 79.05 | .66 | | |
| 1915.38 | 2 | 79.55 | .66 | | |
| 1916.35 | 2 | 78.05 | .62 | | |
| 1917.33 | 3 | 79.10 | .59 | | |
| 1918.36 | 3 | 80.63 | .59 | | |
| 1919.33 | 3 | 79.90 | .65 | | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece | Remarks |
|----------------------------------|------------|----------|------------------|-----------|------------------|
| | h | ° | " | | |
| 42 Comae, 6406 | | | | | |
| 13 ^h 5.2 ^m | | +18° 4' | | 5.2 5.4 | |
| 1907.300 | 12.5 | 192.2 | 0.65 | VII | Very blurred. |
| .303 | 10.3 | 187.7 | 0.68 | VII | Blurred. |
| 1908.519 | 15.7 | 195.3 | 0.58 | VI | |
| .521 | 15.5 | 195.1 | 0.58 | VII | |
| 1909.374 | 13.2 | 11.6 | 0.56 | VII | |
| .384 | 13.1 | 191.4 | 0.43 | VII | |
| .464 | 14.3 | 10.5 | 0.39 | VII | |
| 1914.374 | 13.0 | 11.5 | 0.56 | 9 | |
| .409 | 13.5 | 14.3 | 0.48 | 7 | |
| 1915.352 | 11.9 | 190.7 | 0.57 | 7 | |
| .355 | 11.2 | 189.9 | 0.56 | 7 | |
| .409 | 13.8 | 194.7 | 0.54 | 7 | |
| 1916.390 | 12.4 | 190.6 | 0.50 | 7 | |
| .393 | 11.9 | 190.5 | 0.61 | 7 | |
| .516 | 15.6 | 193.4 | 0.62 | 7 | |
| 1917.292 | 11.1 | 191.7 | 0.52 | 7 | |
| .343 | 13.2 | 193.1 | 0.42 | 7 | |
| .349 | 12.0 | 187.6 | 0.5 <i>est.</i> | 7 | Clouds. |
| .401 | 12.3 | 191.0 | 0.44 | 7 | |
| 1918.365 | 12.7 | 188.9 | 0.44 | 7 | Separated. |
| .387 | 11.8 | 184.4 | 0.50 | 7 | Separated. |
| .442 | 13.1 | 187.7 | 0.42 | 7 | Very bad seeing. |
| 1919.300 | 11.1 | 187.6 | 0.30 <i>est.</i> | 7 | Elongated. |
| .305 | 10.9 | 183.5 | 0.35 <i>est.</i> | 7 | Not separated. |
| .374 | 12.3 | 186.6 | 0.40 <i>est.</i> | 7 | Elongated. |
| 1894.33 | 3 <i>n</i> | 180.13 | 0.25 | | |
| 1895.35 | 2-3 | 164. | .20 | | |
| 1896. | 2 | ? | ? | | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece | Remarks |
|------|---------|----------|----------|----------|---------|
| h | ° | " | | | |

42 Comae, 6406—Continued

| | | | | | |
|---------|---|--------|-----|--|--|
| 1899.53 | 3 | 192.73 | .28 | | |
| 1901.35 | 4 | 190.65 | .46 | | |
| 1902.39 | 3 | 192.10 | .54 | | |
| 1903.34 | 3 | 191.26 | .60 | | |
| 1907.30 | 2 | 189.95 | .66 | | |
| 1908.52 | 2 | 195.20 | .58 | | |
| 1909.41 | 3 | 191.17 | .46 | | |
| 1914.39 | 2 | 12.90 | .52 | | |
| 1915.37 | 3 | 11.77 | .56 | | |
| 1916.43 | 3 | 11.50 | .58 | | |
| 1917.35 | 4 | 10.85 | .47 | | |
| 1918.40 | 3 | 7.00 | .45 | | |
| 1919.33 | 3 | 5.90 | .35 | | |

β 800, 6442

13^h 11.9^m

+17° 34'

6.5 10.1

| | | | | | |
|----------|------|--------|------|----|--|
| 1907.300 | 12.1 | 113.3 | 3.56 | V | |
| .303 | 10.5 | 107.6 | 3.27 | V | |
| 1908.480 | 15.6 | 113.5 | 3.29 | X | |
| .491 | 15.3 | 111.5 | 3.40 | V | |
| 1914.374 | 13.2 | 109.8 | 3.75 | 12 | |
| .389 | 12.6 | 108.6 | 3.70 | 12 | |
| 1889.12 | 5 n | 117.06 | 2.17 | | |
| 1895.06 | 3 | 115.30 | 2.47 | | |
| 1896.40 | 3 | 113.13 | 2.50 | | |
| 1897.41 | 3 | 115.17 | 2.50 | | |
| 1898.42 | 3 | 112.87 | 2.68 | | |
| 1899.50 | 3 | 112.90 | 2.72 | | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece | Remarks |
|------|---------|----------|----------|----------|---------|
| | h | ° | ' | | |

 β 800, 6442—Continued

| | | | | | |
|---------|---|--------|------|--|--|
| 1901.33 | 4 | 110.72 | 2.73 | | |
| 1902.48 | 3 | 112.00 | 2.83 | | |
| 1903.33 | 3 | 112.47 | 2.98 | | |
| 1907.30 | 2 | 109.45 | 3.40 | | |
| 1908.49 | 2 | 112.50 | 3.34 | | |
| 1914.38 | 2 | 109.20 | 3.72 | | |

O Σ 266, 649413^h 23.6^m

+16° 16'

7.9 8.4

| | | | | | |
|----------|------|--------|------|-----|--|
| 1907.300 | 12.3 | 343.8 | 1.79 | VI | |
| .303 | 10.7 | 340.5 | 1.46 | V | |
| 1908.480 | 15.8 | 341.7 | 1.64 | III | |
| .491 | 15.5 | 340.8 | 1.48 | V | |
| 1914.374 | 13.5 | 345.3 | 1.75 | 12 | |
| 1894.18 | 4 n | 339.70 | 1.48 | | |
| 1895.45 | 2 | 341.80 | 1.59 | | |
| 1901.39 | 2 | 341.80 | 1.65 | | |
| 1906.49 | 2 | 343.45 | 1.57 | | |
| 1907.30 | 2 | 342.15 | 1.62 | | |
| 1908.49 | 2 | 341.25 | 1.56 | | |
| 1914.37 | 1 | 345.3 | 1.75 | | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece | Remarks |
|------|---------|----------|----------|-----------|---------|
| | h | ° | " | | |

O Σ 269, 652413^h 28.3^m

+35° 25'

6.8 7.

| | | | | | |
|----------|------|--------|------------------|----|----------------------|
| 1914.508 | 15.2 | 237.5 | 0.25 <i>est.</i> | 7 | Elongated. |
| .513 | 15.8 | 227.4 | 0.39 | 7 | Notched. |
| .532 | 15.8 | 227.2 | 0.33 | 7 | Notched. |
| 1915.352 | 11.9 | 226.4 | 0.25 <i>est.</i> | 7 | Wedge. |
| .508 | 15.4 | 229.8 | 0.30 <i>est.</i> | 7 | Elongated. |
| 1917.390 | 12.3 | 241.3 | 0.25 <i>est.</i> | 7 | Elongated. |
| .404 | 12.4 | 219.7 | 0.25 <i>est.</i> | 7 | Slight elongation. |
| 1918.501 | 15.8 | 224.0 | 0.20 <i>est.</i> | 7 | Elongated. |
| .510 | 15.6 | 240.2 | 0.25 <i>est.</i> | 7 | Doubtful elongation. |
| .521 | 16.3 | ..... | .... | .. | Cannot |
| 1919.300 | 11.2 | 241.6 | 0.25 <i>est.</i> | 7 | Suspect elongation. |
| .396 | 12.6 | 237.4 | 0.30 <i>est.</i> | 7 | Elongated. |
| 1896.08 | 4 n | 205.70 | 0.28 | | |
| 1898.22 | 3 | 212.02 | .25 | | |
| 1899.53 | 3 | 225.63 | .25 | | |
| 1901.47 | 3 | 226.17 | .28 | | |
| 1902.52 | 3 | 223.17 | .25 | | |
| 1903.33 | 3 | 219.97 | .23 | | |
| 1906. | 1 | ? | ? | | |
| 1914.52 | 3 | 230.70 | .32 | | |
| 1915.43 | 2 | 228.10 | .28 | | |
| 1917.40 | 2 | 230.50 | .25 | | |
| 1918.51 | 2 | 232.10 | .22 | | |
| 1919.35 | 2 | 239.50 | .28 | | |

| Date | Sid. T. | p | s | Eyepiece | Remarks |
|------|---------|-----|-----|----------|---------|
| h | ° | " | | | |

 Σ 1757, 653013^h 29.2^m

+0° 12'

7.4 8.7

| | | | | | |
|----------|------|-------|------|-----|------------------------------|
| 1908.480 | 16.0 | 81.3 | 2.51 | III | Good. |
| .491 | 15.7 | 82.3 | 2.69 | V | |
| 1909.374 | 13.4 | 80.5 | 2.70 | VII | |
| .407 | 14.7 | 82.2 | 2.54 | III | |
| 1910.546 | 16.2 | 81.2 | 2.32 | VI | |
| 1912.459 | 13.9 | 81.5 | 2.72 | VI | |
| .472 | 14.9 | 82.4 | 2.65 | VI | |
| 1914.374 | 13.8 | 82.3 | 2.51 | 12 | |
| .389 | 14.0 | 82.6 | 2.37 | 12 | |
| 1916.409 | 12.7 | 83.2 | 2.51 | 9 | |
| .412 | 12.8 | 84.1 | 2.69 | V | Very bad seeing. Diffuse. |
| .519 | 15.3 | 87.2 | 2.46 | V | |
| 1918.387 | 12.0 | 83.6 | 2.50 | 7 | |
| .412 | 12.6 | 85.6 | 2.54 | 12 | Thro clouds |
| .417 | 13.2 | 86.5 | 2.61 | 9 | |
| 1892.53 | 3 n | 73.73 | 2.34 | | |
| 1895.18 | 4 | 75.00 | 2.38 | | |
| 1903.39 | 3 | 78.03 | 2.46 | | |
| 1906.50 | 2 | 80.35 | 2.42 | | |
| 1908.49 | 2 | 81.80 | 2.60 | | |
| 1809.78 | 3 | 81.30 | 2.52 | | |
| 1912.47 | 2 | 81.70 | 2.56 | | |
| 1914.38 | 2 | 82.45 | 2.44 | | |
| 1916.45 | 3 | 84.83 | 2.55 | | |
| 1918.40 | 3 | 85.23 | 2.55 | | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece | Remarks |
|------|---------|----------|----------|----------|---------|
|------|---------|----------|----------|----------|---------|

25 Can. Ven. 6566

13^h 33.0^m

+36° 48'

4.9 8.4

| | | | | | |
|----------|------|-------|------|-----|------------------|
| 1907.645 | 18.1 | 128.0 | 1.00 | VI | |
| .648 | 18.2 | 128.9 | 1.28 | VI | Good. |
| 1908.480 | 15.0 | 128.5 | 1.25 | VI | Blurred. |
| .483 | 15.6 | 127.6 | 1.21 | VI | Good. |
| 1909.464 | 15.7 | 123.8 | 1.22 | V | Bad seeing. |
| .480 | 16.3 | 127.2 | 1.02 | VI | |
| 1910.521 | 16.5 | 125.1 | 1.20 | VII | |
| .527 | 16.0 | 125.9 | 1.17 | VII | Blurred. |
| 1912.459 | 15.3 | 124.4 | 1.14 | V | Poor seeing. |
| .472 | 15.1 | 125.7 | 1.23 | VI | |
| 1913.483 | 16.2 | 124.8 | 1.14 | VI | |
| .552 | 16.8 | 124.5 | 1.35 | VI | |
| .584 | 16.7 | 123.6 | 1.36 | VII | Good. |
| 1914.437 | 16.0 | 123.9 | 1.38 | 9 | |
| .461 | 16.0 | 122.7 | 1.34 | 7 | |
| .508 | 15.3 | 125.0 | 1.35 | 12 | |
| 1915.352 | 12.1 | 120.2 | 1.36 | 12 | Blurred. |
| .355 | 11.6 | 122.8 | 1.65 | 7 | Very bad seeing. |
| .606 | 17.2 | 123.9 | 1.32 | 7 | |
| 1916.360 | 11.9 | 119.6 | 1.58 | 7 | Very bad seeing. |
| .393 | 12.4 | 124.2 | 1.42 | 7 | |
| .445 | 15.9 | 121.6 | 1.46 | 12 | |
| 1917.292 | 11.2 | 124.0 | 1.40 | 7 | |
| .352 | 12.5 | 122.6 | 1.48 | 7 | |
| .365 | 11.6 | 120.3 | 1.27 | 9 | |
| 1918.387 | 12.2 | 124.4 | 1.70 | 7 | |
| .475 | 14.7 | 122.1 | 1.41 | 7 | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece | Remarks |
|------|----------|----------|----------|-----------|---------|
| | <i>h</i> | <i>°</i> | <i>"</i> | | |

25 Can Ven, 6566—Continued

| | | | | | |
|----------|------------|--------|------|---|------------------|
| 1918.501 | 16.3 | 123.4 | 1.32 | 7 | |
| 1919.294 | 10.2 | 120.7 | 1.54 | 7 | Very bad seeing. |
| .308 | 9.6 | 122.9 | 1.67 | 9 | Very bad seeing. |
| .313 | 10.2 | 124.9 | 1.66 | 7 | Very bad seeing. |
| 1892.88 | 4 <i>n</i> | 139.73 | 0.93 | | |
| 1895.52 | 2 | 137.40 | 0.90 | | |
| 1896.31 | 3 | 135.07 | 1.07 | | |
| 1897.57 | 3 | 136.33 | 1.08 | | |
| 1898.49 | 3 | 134.40 | 0.96 | | |
| 1899.53 | 3 | 134.23 | 1.12 | | |
| 1901.46 | 3 | 135.33 | 1.20 | | |
| 1902.49 | 3 | 134.73 | 1.12 | | |
| 1903.37 | 4 | 128.75 | 1.24 | | |
| 1904.54 | 3 | 132.17 | 0.97 | | |
| 1906.50 | 3 | 131.33 | 1.09 | | |
| 1907.65 | 2 | 128.45 | 1.14 | | |
| 1908.48 | 2 | 128.05 | 1.23 | | |
| 1909.47 | 2 | 125.50 | 1.12 | | |
| 1910.52 | 2 | 125.50 | 1.18 | | |
| 1912.47 | 2 | 125.05 | 1.18 | | |
| 1913.54 | 3 | 124.30 | 1.28 | | |
| 1914.47 | 3 | 123.87 | 1.36 | | |
| 1915.44 | 3 | 123.30 | 1.44 | | |
| 1916.40 | 3 | 121.80 | 1.49 | | |
| 1917.34 | 3 | 122.30 | 1.38 | | |
| 1918.45 | 3 | 123.30 | 1.48 | | |
| 1919.30 | 3 | 122.83 | 1.62 | | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece | Remarks |
|------|---------|----------|----------|-----------|---------|
| | h | ° | " | | |

β 612, 6578

13^h 34.7^m

+11° 15'

5.5 ...

| | | | | | |
|----------|------------|----------|------------------|---|----------------------|
| 1914.437 | 14.8 | 28.6 | 0.3 <i>est.</i> | 7 | Elongated. |
| .461 | 15.3 | 14.8 | 0.30 <i>est.</i> | 7 | Elongated. |
| 1915.409 | 13.6 | 30.2 | 0.32 | 7 | Elongated. |
| .508 | 15.1 | 21.1 | 0.35 <i>est.</i> | 7 | Elongated. |
| 1916.390 | 12.6 | 29.9 | 0.30 <i>est.</i> | 7 | Elongated. |
| .579 | 17.1 | 32.3 | 0.30 <i>est.</i> | 7 | Elongated. |
| 1917.390 | 12.1 | 20.9 | 0.30 <i>est.</i> | 7 | Elongated. |
| .401 | 12.5 | 26.9 | 0.33 | 7 | Not separated. |
| .404 | 12.5 | 19.9 | 0.39 | 7 | Notched. |
| 1918.431 | 13.6 | 215.8 | 0.30 <i>est.</i> | 7 | Wedge. |
| .501 | 15.3 | 215.5 | 0.30 <i>est.</i> | 7 | Elongated. |
| .510 | 15.5 | [268.8]: | 0.25 | 7 | Doubtful elongation. |
| 1919.396 | 12.7 | 217.5 | 0.35 <i>est.</i> | 7 | Wedge. |
| .521 | 15.4 | 218.2 | 0.30 <i>est.</i> | 7 | Not separated. |
| 1893 | 1 <i>n</i> | ? | ? | | |
| 1894.29 | 2 | 203.70 | 0.29 | | |
| 1895.42 | 4 | 212.10 | .24 | | |
| 1896.38 | 2 | 212.50 | .37 | | |
| 1897.53 | 2 | 224.15 | .25 | | |
| 1899.13 | 4 | 230.78 | .30 | | |
| 1901.44 | 3 | 236.67 | .28 | | |
| 1902.53 | 2 | 258.95 | .25 | | |
| 1903. | .... | ..... | .... |  | Cannot |
| 1904. | .... | ..... | .... |  | Cannot. |
| 1906. | .... | ..... | .... |  | Cannot. |
| 1914.45 | 2 | 21.70 | .30 | | |
| 1915.46 | 2 | 25.65 | .34 | | |
| 1916.48 | 2 | 31.10 | .30 | | |

OBSERVATIONS OF DOUBLE STARS

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece | Remarks |
|------|----------|----------|----------|----------|---------|
| | <i>h</i> | <i>°</i> | <i>'</i> | | |

β 612, 6578—Continued

| | | | | | |
|---------|---|-------|-----|--|--|
| 1917.40 | 3 | 22.63 | .34 | | |
| 1918.47 | 2 | 35.65 | .30 | | |
| 1919.46 | 2 | 37.85 | .32 | | |

Σ 1785, 6641

13^h 44.6^m

+27° 29'

7.3 7.6

| | | | | | |
|----------|------|-------|------|-----|----------------|
| 1907.565 | 17.0 | 308.1 | 1.32 | VI | Good. |
| .614 | 18.5 | 309.5 | 1.43 | VI | |
| 1908.483 | 16.1 | 311.0 | 1.26 | VI | |
| .491 | 15.8 | 312.6 | 1.20 | V | |
| 1909.480 | 16.5 | 317.4 | 1.48 | VI | Good. |
| .491 | 14.8 | 317.1 | 1.10 | VI | Good. |
| 1910.527 | 16.2 | 320.1 | 1.25 | VII | |
| .541 | 16.0 | 320.2 | 1.17 | VI | |
| 1912.472 | 15.3 | 329.4 | 1.34 | VI | |
| .500 | 15.5 | 329.1 | 1.17 | VI | |
| 1913.552 | 16.6 | 332.9 | 1.32 | VI | |
| .557 | 16.3 | 333.3 | 1.48 | VI | Through clouds |
| 1914.389 | 14.2 | 341.8 | 1.00 | 12 | |
| .461 | 15.5 | 337.8 | 1.37 | 7 | Good. |
| .572 | 17.7 | 337.7 | 1.33 | 7 | Bad seeing. |
| 1915.355 | 11.4 | 342.8 | 1.48 | 7 | |
| .360 | 11.9 | 344.7 | 1.63 | 7 | |
| .606 | 17.4 | 342.4 | 1.29 | 7 | |
| 1916.341 | 11.0 | 348.1 | 1.34 | 7 | Very blurred. |
| .360 | 11.7 | 347.8 | 1.30 | 7 | Very blurred. |
| .390 | 12.8 | 349.4 | 1.47 | 7 | |
| 1917.352 | 12.8 | 351.2 | 1.31 | 7 | |
| .363 | 13.1 | 352.1 | 1.29 | 7 | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece | Remarks |
|------|---------|----------|----------|-----------|---------|
| | h | ° | " | | |

Σ 1785, 6641—Continued

| | | | | | |
|----------|------|--------|------|---|------------------------------------|
| 1917.365 | 12.5 | 352.8 | 1.31 | 7 | Very bad seeing. Through clouds |
| 1918.365 | 12.9 | 356.1 | 1.36 | 7 | |
| .387 | 12.4 | 351.6 | 1.10 | 7 | |
| .475 | 15.2 | 360.5 | 1.28 | 7 | |
| 1919.305 | 11.0 | 362.6 | 1.26 | 7 | |
| .313 | 10.4 | 362.4 | 1.41 | 7 | |
| .374 | 12.5 | 364.3 | 1.23 | 7 | |
| 1892.48 | 3 n | 248.07 | 1.39 | | |
| 1895.52 | 2 | 259.50 | 1.47 | | |
| 1896.35 | 4 | 262.30 | 1.42 | | |
| 1897.47 | 3 | 266.47 | 1.39 | | |
| 1898.45 | 3 | 271.30 | 1.35 | | |
| 1899.49 | 3 | 274.80 | 1.52 | | |
| 1901.41 | 4 | 282.50 | 1.30 | | |
| 1902.50 | 3 | 286.67 | 1.38 | | |
| 1903.36 | 3 | 292.57 | 1.46 | | |
| 1905.86 | 3 | 301.23 | 1.28 | | |
| 1907.59 | 2 | 308.80 | 1.38 | | |
| 1908.49 | 2 | 311.80 | 1.23 | | |
| 1909.49 | 2 | 317.25 | 1.29 | | |
| 1910.53 | 2 | 320.15 | 1.21 | | |
| 1912.49 | 2 | 329.25 | 1.26 | | |
| 1913.55 | 2 | 333.10 | 1.40 | | |
| 1914.47 | 3 | 339.10 | 1.23 | | |
| 1915.47 | 3 | 343.30 | 1.47 | | |
| 1916.36 | 3 | 346.63 | 1.37 | | |
| 1917.36 | 3 | 352.03 | 1.30 | | |
| 1918.41 | 3 | 356.07 | 1.25 | | |
| 1919.33 | 3 | 363.10 | 1.30 | | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece | Remarks |
|------|----------|----------|----------|-----------|---------|
| | <i>h</i> | <i>°</i> | <i>"</i> | | |

O Σ 278 676414^h 8.3^m

+44° 39'

7.7 ...

| | | | | | |
|----------|------------|--------|------------------|------|-----------------------|
| 1907.565 | 17.2 | 78.0 | 0.25 <i>est.</i> | VII | |
| .614 | 18.7 | 78.0 | 0.25 <i>est.</i> | VII | Elongated. |
| 1908.574 | 16.5 | 88.0 | 0.30 <i>est.</i> | VII | Elongated, Difficult. |
| .617 | 18.2 | 65.7 | 0.30 <i>est.</i> | VIII | Elongated |
| 1909.480 | 16.7 | 76.0 | 0.25 <i>est.</i> | VII | Elongated. |
| .560 | 17.5 | 85.5 | 0.30 <i>est.</i> | VII | Elongated. |
| 1910.527 | 16.6 | 81.3 | 0.30 <i>est.</i> | VII | Uncertain elongation. |
| .603 | 17.0 | 78.7 | 0.30 <i>est.</i> | VII | Elongated. |
| 1913.513 | 15.7 | 76.6 | 0.30 <i>est.</i> | VII | Notched. |
| .519 | 15.5 | 78.9 | 0.30 <i>est.</i> | VII | Elongated. |
| 1914.508 | 15.5 | 84.5 | 0.25 <i>est.</i> | 7 | Suspect elongation. |
| .513 | 15.4 | 73.9 | 0.40 | 7 | Notched. |
| .519 | 17.2 | 75.1 | 0.39 | 7 | Notched. |
| 1916.393 | 12.7 | 69.2 | 0.30 <i>est.</i> | 7 | Elongated. |
| .516 | 15.7 | 73.4 | 0.30 <i>est.</i> | 7 | Elongated. |
| .579 | 17.4 | 64.9 | 0.25 <i>est.</i> | 7 | Elongated. |
| 1917.352 | 11.5 | 71.0 | 0.25 <i>est.</i> | 7 | Elongated. |
| .365 | 11.7 | 67.5 | 0.25 <i>est.</i> | 7 | Doubtful elongation. |
| .390 | 12.4 | 81.5 | 0.25 <i>est.</i> | 7 | Elongated. |
| 1918.501 | 16.2 | 63.6 | 0.25 <i>est.</i> | 7 | Elongated. |
| .510 | 15.7 | 65.5 | 0.30 <i>est.</i> | 7 | Elongated. |
| .516 | 17.2 | 63.8 | 0.30 <i>est.</i> | 7 | Elongated. |
| 1919.541 | 15.9 | 63.2 | 0.30 <i>est.</i> | 7 | Not separated. |
| .631 | 18.3 | 62.7 | 0.30 <i>est.</i> | 7 | Elongated. |
| .637 | 18.3 | 64.7 | 0.30 <i>est.</i> | 7 | Elongated. |
| 1893.58 | 2 <i>n</i> | 97.50 | 0.36 | | |
| 1895.53 | 3 | 97.20 | .30 | | |
| 1896.31 | 3 | 101.77 | .30 | | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece | Remarks |
|------|----------|----------|----------|----------|---------|
| | <i>h</i> | <i>°</i> | <i>'</i> | | |

O Σ 278, 6764—Continued

| | | | | | |
|---------|---|-------|------|--|--|
| 1897.64 | 3 | 94.70 | 0.32 | | |
| 1898.49 | 3 | 94.50 | .30 | | |
| 1899.53 | 3 | 90.17 | .30 | | |
| 1901.47 | 2 | 84.20 | .28 | | |
| 1902.81 | 3 | 87.27 | .29 | | |
| 1906.56 | 2 | 82.50 | .28 | | |
| 1907.59 | 2 | 78.00 | .25 | | |
| 1908.59 | 2 | 76.85 | .30 | | |
| 1909.52 | 2 | 80.75 | .28 | | |
| 1910.56 | 2 | 80.00 | .30 | | |
| 1913.52 | 2 | 77.75 | .30 | | |
| 1914.51 | 3 | 77.83 | .35 | | |
| 1916.50 | 3 | 69.17 | .28 | | |
| 1917.37 | 3 | 73.33 | .25 | | |
| 1918.51 | 3 | 64.30 | .28 | | |
| 1919.60 | 3 | 63.53 | .30 | | |

 β 1272, 681314^h 14.1^m

+49° 12'

8.1 10.1

| | | | | | |
|----------|------|--------|------|---|---------------------------------------|
| 1917.352 | 11.9 | 131.9 | 1.48 | 7 | No perceptible motion in 25 years. |
| .390 | 12.7 | 132.1 | 1.15 | V | |
| 1917.37 | 2 n | 132.00 | 1.32 | | |

| Date | Sid. T. | p | s | Eyepiece | Remarks |
|------|---------|-----|-----|----------|---------|
| | h | ° | ' | | |

 Σ 1834, 683214^h 16.7^m

+48° 57'

7.2 ...

| | | | | | |
|----------|------|--------|------------------|-----------------------------|----------------------|
| 1908.571 |  | .... | ..... | Suspect elongation in 110°. | |
| 1913.584 | 17.0 | 93.7 | 0.36 | VII | Elongated. |
| 1914.508 | 15.6 | 92.1 | 0.25 <i>est.</i> | 7 | Doubtful elongation. |
| .513 | 15.6 | 93.1 | 0.30 <i>est.</i> | 7 | Elongated. |
| .582 | 17.7 | 85.4 | 0.25 <i>est.</i> | 7 | Elongated. |
| 1916.393 | 12.8 | 94.6 | 0.25 <i>est.</i> | 7 | |
| .516 | 15.8 | 95.0 | 0.25 <i>est.</i> | 7 | Suspect elongation. |
| .579 | 17.6 | 91.7 | 0.25 <i>est.</i> | 7 | Elongated. |
| 1917.352 | 12.1 | 95.9 | 0.30 <i>est.</i> | 7 | Elongated. |
| .365 | 11.9 | 271.1 | 0.30 <i>est.</i> | 7 | Wedge. |
| .390 | 12.6 | 94.0 | 0.30 <i>est.</i> | 7 | Wedge. |
| 1918.501 | 16.0 | 95.6 | 0.30 <i>est.</i> | 7 | Elongated. |
| .510 | 15.9 | 91.8 | 0.35 <i>est.</i> | 7 | Distinct elongation. |
| .516 | 17.3 | 95.8 | 0.35 <i>est.</i> | 7 | Notched. |
| 1919.541 | 16.0 | 90.6 | 0.33 | 7 | Notched. |
| .631 | 18.4 | 93.7 | 0.35 <i>est.</i> | 7 | Not separated. |
| .637 | 18.4 | 91.2 | 0.35 <i>est.</i> | 7 | Notched. |
| 1893.58 | 1 n | 113.6 | 0.25 | | |
| 1895. | 2 | ? | ? | | |
| 1914.30 | 4 | 271.07 | .29 | | |
| 1916.50 | 3 | 273.77 | .25 | | |
| 1917.37 | 3 | 273.67 | .30 | | |
| 1918.51 | 3 | 274.40 | .33 | | |
| 1919.60 | 3 | 271.83 | .34 | | |

| Date | Sid. T. | p | s | Eyepiece | Remarks |
|-----------------------------------|---------|----------|------|----------|------------------|
| | h | ° | ' | | |
| Σ 1837, 6851 | | | | | |
| 14 ^h 19.3 ^m | | -11° 13' | | 6.5 8.3 | |
| 1908.483 | 15.8 | 299.6 | 1.28 | VI | |
| .491 | 16.1 | 302.1 | 1.20 | VI | Very blurred. |
| 1909.464 | 14.6 | 300.8 | 1.20 | III | |
| .466 | 14.3 | 304.5 | 1.29 | VIII | Very bad seeing. |
| .480 | 15.2 | 300.2 | 1.13 | VII | |
| 1912.472 | 15.6 | 295.2 | 1.31 | VI | |
| .500 | 15.8 | 296.8 | 1.21 | VI | |
| 1914.437 | 15.0 | 298.2 | 1.45 | 7 | |
| .461 | 15.1 | 299.8 | 1.37 | 7 | |
| 1915.411 | 14.0 | 299.4 | 1.10 | 9 | |
| .469 | 14.4 | 297.8 | 1.09 | 12 | |
| 1916.382 | 14.1 | 297.9 | 1.09 | 12 | Very bad seeing. |
| .412 | 13.1 | 301.6 | 0.99 | 12 | |
| .445 | 14.9 | 297.8 | 1.17 | 12 | |
| 1917.374 | 13.3 | 299.5 | 1.09 | 9 | |
| .377 | 12.4 | 302.5 | 1.21 | V | Difficult. |
| .401 | 12.7 | 302.2 | 1.23 | V | |
| 1918.431 | 13.9 | 297.3 | 1.27 | 7 | |
| .442 | 13.8 | 302.1 | 0.99 | 7 | Bad seeing. |
| .501 | 15.0 | 295.8 | 1.20 | 7 | Good. |
| 1919.374 | 12.7 | 302.6 | 1.28 | 7 | |
| .396 | 12.9 | 301.7 | 1.26 | 7 | |
| .510 | 15.7 | 296.6 | 1.17 | 7 | Very bad seeing. |
| 1895.51 | 3 n | 305.37 | 1.16 | | |
| 1896.40 | 4 | 307.35 | 1.33 | | |
| 1903.06 | 3 | 302.67 | 1.15 | | |
| 1906.50 | 2 | 302.70 | 1.14 | | |
| 1908.49 | 2 | 300.85 | 1.24 | | |

Ob 5

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece | Remarks |
|------|---------|----------|----------|-----------|---------|
| h | ° | " | | | |

 Σ 1837, 6851—Continued

| | | | | | |
|---------|---|--------|------|--|--|
| 1909.47 | 3 | 301.83 | 1.21 | | |
| 1912.49 | 2 | 296.00 | 1.26 | | |
| 1914.45 | 2 | 299.50 | 1.41 | | |
| 1915.44 | 2 | 298.60 | 1.10 | | |
| 1916.41 | 3 | 299.10 | 1.08 | | |
| 1917.48 | 3 | 301.40 | 1.18 | | |
| 1918.46 | 3 | 298.40 | 1.15 | | |
| 1919.43 | 3 | 300.30 | 1.24 | | |

 ζ Bootis, 695514^h 36.3^m

+14° 9'

4.4 4.8

| | | | | | |
|----------|------|-------|------|------|-----------------------|
| 1907.565 | 17.3 | 325.1 | 0.59 | VII | |
| .571 | 16.9 | 321.0 | 0.48 | VII | |
| .574 | 16.8 | 320.7 | 0.66 | VII | |
| 1908.490 | 16.7 | 321.9 | 0.59 | VII | |
| .483 | 15.3 | 322.9 | 0.77 | VI | Good. |
| 1909.374 | 13.7 | 142.6 | 0.54 | VII | |
| .384 | 13.8 | 143.1 | 0.67 | VII | |
| .387 | 12.3 | 323.5 | 0.52 | VIII | Blurred and uncertain |
| 1910.439 | 13.5 | 143.4 | 0.67 | VI | Blurred. |
| .508 | 16.2 | 320.6 | 0.52 | VIII | |
| .521 | 16.3 | 320.5 | 0.62 | VII | |
| 1912.472 | 15.8 | 140.6 | 0.74 | VI | |
| .500 | 16.0 | 137.9 | 0.65 | VII | |
| 1913.472 | 14.8 | 144.0 | 0.70 | VII | |
| .483 | 15.8 | 319.3 | 0.67 | VII | |
| 1914.374 | 14.0 | 323.0 | 0.79 | 7 | |
| .389 | 14.5 | 319.0 | 0.75 | 7 | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece | Remarks |
|------|----------|----------|----------|-----------|---------|
| | <i>h</i> | <i>°</i> | <i>'</i> | | |

ζ Bootis, 6955—Continued

| | | | | | |
|----------|------------|--------|------|---|------------------|
| 1915.409 | 12.4 | 322.0 | 0.72 | 7 | Daylight |
| .411 | 13.2 | 143.1 | 0.60 | 9 | |
| 1916.360 | 11.5 | 140.2 | 0.61 | 7 | Very bad seeing. |
| .390 | 13.0 | 138.6 | 0.78 | 7 | |
| .393 | 12.2 | 138.3 | 0.78 | 7 | |
| 1917.343 | 13.4 | 139.4 | 0.80 | 7 | |
| .352 | 13.0 | 138.6 | 0.75 | 7 | |
| .363 | 13.3 | 319.8 | 0.63 | 7 | |
| 1918.412 | 12.8 | 318.5 | 0.65 | 7 | |
| .431 | 14.1 | 320.6 | 0.73 | 7 | Good. |
| .442 | 14.0 | 315.9 | 0.68 | 7 | Very bad seeing. |
| 1919.396 | 13.1 | 318.6 | 0.86 | 7 | |
| .488 | 15.3 | 319.5 | 0.88 | 7 | Bad seeing. |
| .491 | 15.0 | 322.3 | 0.86 | 7 | |
| 1898 | 4 <i>n</i> | ? | ? | | |
| 1901.45 | 4 | 149.40 | 0.31 | | |
| 1902.52 | 3 | 152.90 | .36 | | |
| 1903.37 | 4 | 146.62 | .38 | | |
| 1904.57 | 3 | 148.00 | .43 | | |
| 1906.50 | 3 | 147.60 | .46 | | |
| 1907.57 | 3 | 142.37 | .58 | | |
| 1908.48 | 2 | 142.40 | .68 | | |
| 1909.38 | 3 | 143.07 | .58 | | |
| 1910.49 | 3 | 141.50 | .60 | | |
| 1912.49 | 2 | 139.25 | .70 | | |
| 1913.48 | 2 | 141.65 | .68 | | |
| 1914.38 | 2 | 141.00 | .77 | | |
| 1915.41 | 2 | 142.55 | .66 | | |
| 1916.38 | 3 | 139.03 | .72 | | |

OBSERVATIONS OF DOUBLE STARS

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece | Remarks |
|------|---------|----------|----------|-----------|---------|
| | h | ° | " | | |

ζ Bootis, 6955—Continued

| | | | | | |
|---------|---|--------|-----|--|--|
| 1917.35 | 3 | 139.27 | .73 | | |
| 1918.43 | 3 | 138.33 | .69 | | |
| 1919.46 | 3 | 140.13 | .87 | | |

Σ 1879, 6999

14^h 41.4^m

+10° 4'

7.2 8.8

| | | | | | |
|----------|------|-------|------|------|-------------|
| 1907.574 | 17.1 | 124.4 | 0.63 | VII | |
| .579 | 16.8 | 128.1 | 0.70 | VII | |
| 1908.483 | 16.3 | 128.2 | 0.57 | VII | |
| .494 | 15.6 | 124.9 | 0.69 | VI | |
| 1909.384 | 14.0 | 123.7 | 0.72 | VII | |
| .464 | 14.8 | 126.4 | 0.59 | VIII | |
| 1910.527 | 16.4 | 125.0 | 0.56 | VII | |
| .541 | 16.3 | 122.4 | 0.62 | VII | |
| 1912.472 | 16.0 | 120.3 | 0.78 | VI | |
| .500 | 16.2 | 118.9 | 0.70 | VII | |
| 1913.552 | 17.0 | 119.7 | 0.66 | VI | |
| .557 | 17.0 | 120.6 | 0.80 | VI | |
| 1914.437 | 15.3 | 118.5 | 0.73 | 7 | |
| .508 | 15.9 | 121.6 | 0.71 | 7 | |
| 1916.360 | 12.2 | 118.6 | 0.58 | 7 | Bad seeing. |
| .390 | 13.5 | 119.1 | 0.68 | 7 | |
| .445 | 15.2 | 118.6 | 0.70 | 7 | |
| 1917.343 | 13.6 | 115.2 | 0.75 | 7 | |
| .363 | 13.5 | 120.0 | 0.52 | 7 | |
| .374 | 12.5 | 121.0 | 0.54 | 9 | |
| 1918.431 | 14.3 | 117.0 | 0.76 | 7 | |
| .501 | 15.2 | 115.3 | 0.70 | 7 | Good. |
| .510 | 15.2 | 115.2 | 0.64 | 7 | Good. |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece | Remarks |
|------|---------|----------|----------|----------|---------|
| | h | ° | " | | |

 Σ 1879, 6999—Continued

| | | | | | |
|----------|------------|--------|------|---|-------|
| 1919.374 | 13.3 | 116.9 | 0.81 | 7 | Good. |
| .396 | 13.3 | 115.3 | 0.67 | 7 | |
| .491 | 15.1 | 113.3 | 0.80 | 7 | |
| 1894. | 2 <i>n</i> | ? | ? | | |
| 1897.12 | 3 | 145.73 | 0.49 | | |
| 1899.53 | 3 | 141.63 | .57 | | |
| 1902.27 | 4 | 133.77 | .52 | | |
| 1903.68 | 4 | 133.38 | .51 | | |
| 1906.50 | 2 | 131.70 | .56 | | |
| 1907.58 | 2 | 126.25 | .66 | | |
| 1908.49 | 2 | 126.55 | .65 | | |
| 1909.42 | 2 | 125.05 | .66 | | |
| 1910.53 | 2 | 123.70 | .59 | | |
| 1912.49 | 2 | 119.60 | .74 | | |
| 1913.55 | 2 | 120.15 | .73 | | |
| 1914.47 | 2 | 120.05 | .72 | | |
| 1916.40 | 3 | 118.77 | .65 | | |
| 1917.36 | 3 | 118.73 | .60 | | |
| 1918.48 | 3 | 115.83 | .70 | | |
| 1919.42 | 3 | 115.17 | .76 | | |

O Σ 285, 700114^h 41.7^m

+42° 48'

7.2 7.3

| | | | | | |
|----------|------|-------|------------------|-----|---|
| 1907.648 | 18.4 | 283.2 | 0.52 | VII | Notched. Elongated. Separated by glimpses |
| 1908.519 | 17.2 | 284.7 | 0.43 | VII | |
| .571 | 17.9 | 290.4 | 0.3 <i>est.</i> | VII | |
| 1909.480 | 16.8 | 286.5 | 0.30 <i>est.</i> | VII | |
| .560 | 17.7 | 287.1 | 0.45 | VII | |

| Date | Sid. T. | p | s | Eyepiece | Remarks |
|------|---------|-----|-----|----------|---------|
| | h | ° | " | | |

O Σ 285, 7001—Continued

| | | | | | |
|----------|------|--------|------------------|-----|------------------------|
| 1910.527 | 16.7 | 288.2 | 0.35 <i>est.</i> | VII | Notched. |
| .603 | 17.2 | 285.5 | 0.35 <i>est.</i> | VII | Elongated. |
| 1913.513 | 15.9 | 287.0 | 0.40 | VII | Separated. |
| .519 | 15.9 | 279.7 | 0.42 | VII | Separated by glimpses. |
| 1914.508 | 16.2 | 100.1 | 0.48 | 7 | Separated. |
| .513 | 16.0 | 100.0 | 0.47 | 7 | |
| .582 | 17.6 | 97.5 | 0.45 | 7 | Separated. |
| 1915.609 | 17.3 | 95.4 | 0.53 | 7 | Blurred. |
| 1916.393 | 12.6 | 96.1 | 0.39 | 7 | Separated. |
| .516 | 16.3 | 97.8 | 0.51 | 7 | Barely separated. |
| .612 | 18.3 | 94.3 | 0.5 <i>est.</i> | 7 | Very bad. |
| 1917.352 | 12.2 | 99.9 | 0.42 | 7 | |
| .365 | 12.0 | 97.3 | 0.40 <i>est.</i> | 7 | Separated by glimpses. |
| .390 | 12.9 | 98.0 | 0.44 | 7 | |
| 1918.510 | 16.0 | 92.8 | 0.40 | 7 | Well separated. |
| .516 | 17.0 | 93.7 | 0.40 | 7 | Good. |
| 1919.535 | 17.2 | 93.6 | 0.47 | 7 | Blurred. |
| .541 | 16.2 | 89.8 | 0.42 | 7 | |
| .637 | 18.6 | 89.7 | 0.41 | 7 | Separated by glimpses |
| 1893. | 1 n | ? | ? | | |
| 1895.54 | 3 | 141.07 | 0.23 | | |
| 1896.43 | 2 | 144.35 | .32 | | |
| 1897.64 | 3 | 134.27 | .32 | | |
| 1898.47 | 3 | 137.00 | .27 | | |
| 1899.54 | 3 | 131.50 | .30 | | |
| 1902.28 | 4 | 126.35 | .31 | | |
| 1903.38 | 2 | 119.50 | .30 | | |
| 1906.59 | 2 | 114.50 | .40 | | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece | Remarks |
|------|----------|----------|----------|----------|---------|
| | <i>h</i> | <i>°</i> | <i>"</i> | | |

O Σ 285, 7001—Continued

| | | | | | |
|---------|---|--------|------|--|--|
| 1908.24 | 3 | 106.10 | 0.42 | | |
| 1909.52 | 2 | 106.80 | .38 | | |
| 1910.56 | 2 | 106.85 | .35 | | |
| 1913.52 | 2 | 103.35 | .41 | | |
| 1914.53 | 3 | 99.20 | .47 | | |
| 1916.28 | 4 | 95.90 | .47 | | |
| 1917.37 | 3 | 98.40 | .42 | | |
| 1918.51 | 3 | 93.25 | .40 | | |
| 1919.57 | 3 | 91.03 | .43 | | |

 Σ 1883, 701314^h 43.9^m

+6° 23'

6.7 ...

| | | | | | |
|----------|------|-------|------------------|------|------------------------|
| 1907.565 | 17.5 | 236.4 | 0.45 | VII | Notched. |
| .574 | 17.3 | 239.7 | 0.53 | VII | |
| 1908.513 | 15.4 | 233.6 | 0.50 | VI | |
| .519 | 16.2 | 237.9 | 0.45 | VII | |
| 1909.384 | 14.2 | 230.9 | 0.54 | VII | |
| .464 | 15.1 | 230.6 | 0.38 | VIII | Sep. by glimpses |
| 1910.439 | 14.1 | 233.3 | 0.41 | VII | Difficult. |
| .508 | 16.3 | 230.1 | 0.35 <i>est.</i> | VIII | Separated by glimpses. |
| 1912.472 | 16.1 | 228.8 | 0.35 <i>est.</i> | VI | Elongated. |
| .500 | 16.3 | 232.5 | 0.40 <i>est.</i> | VII | Barely separated. |
| 1913.513 | 16.3 | 234.2 | 0.30 <i>est.</i> | VII | Not separated. |
| .519 | 16.1 | 236.7 | 0.30 <i>est.</i> | VII | Elongated. |
| 1914.437 | 15.8 | 232.3 | 0.44 | 7 | Not separated |
| .461 | 15.8 | 232.8 | 0.30 <i>est.</i> | 7 | Elongated. |
| 1915.508 | 15.6 | 227.7 | 0.34 | 7 | Notched. |
| .595 | 17.6 | 218.4 | 0.30 <i>est.</i> | 7 | Difficult Elongation. |

| Date | Sid. T. | p | s | Eyepiece | Remarks |
|------|---------|-----|-----|----------|---------|
| | h | ° | " | | |

 Σ 1883; 7013—Continued

| | | | | | |
|----------|------|--------|------------------|---|----------------------|
| 1916.553 | 16.5 | 226.9 | 0.35 <i>est.</i> | 7 | Elongated. |
| .579 | 17.3 | 227.1 | 0.35 <i>est.</i> | 7 | Notched by glimpses. |
| 1917.404 | 12.7 | 218.0 | 0.33 | 7 | Not separated. |
| .437 | 13.4 | 210.8 | 0.30 <i>est.</i> | 9 | Diffuse |
| .439 | 13.4 | 211.5 | 0.30 <i>est.</i> | 7 | Elongated. |
| 1918.431 | 14.5 | 222.5 | 0.25 <i>est.</i> | 7 | Elongated. |
| .501 | 15.4 | 219.6 | 0.25 <i>est.</i> | 7 | Elongated. |
| .510 | 15.3 | 220.0 | 0.30 <i>est.</i> | 7 | Elongated. |
| 1919.396 | 13.5 | 213.6 | 0.25 <i>est.</i> | 7 | Slight elongation. |
| .491 | 15.2 | 219.2 | 0.30 <i>est.</i> | 7 | Wedge. |
| .541 | 16.4 | 214.2 | 0.30 <i>est.</i> | 7 | Elongated. |
| 1903.38 | 3 n | 242.50 | 0.46 | | |
| 1906.51 | 2 | 239.15 | .56 | | |
| 1907.57 | 2 | 238.05 | .49 | | |
| 1908.52 | 2 | 235.85 | .48 | | |
| 1909.42 | 2 | 230.75 | .46 | | |
| 1910.47 | 2 | 231.70 | .38 | | |
| 1912.49 | 2 | 230.65 | .38 | | |
| 1913.52 | 2 | 235.45 | .30 | | |
| 1914.45 | 2 | 232.55 | .37 | | |
| 1915.55 | 2 | 223.05 | .32 | | |
| 1916.57 | 2 | 227.00 | .35 | | |
| 1917.43 | 3 | 213.43 | .31 | | |
| 1918.48 | 3 | 220.70 | .27 | | |
| 1919.48 | 3 | 215.67 | .28 | | |

| Date | Sid. T. | p | s | Eye-piece | Remarks |
|------|---------|-----|-----|-----------|---------|
| | h | ° | " | | |

ξ Bootis, 7034

14^h 46.8^m

+19° 31'

4.6 7.1

| | | | | | |
|----------|------|-------|------|-----|----------------|
| 1907.554 | 16.8 | 158.7 | 2.42 | VI | |
| .563 | 16.6 | 165.7 | 2.47 | VI | |
| .565 | 17.7 | 162.1 | 2.43 | VII | |
| 1908.480 | 16.2 | 157.9 | 2.58 | X | |
| .483 | 15.2 | 157.5 | 2.43 | VII | |
| .491 | 16.2 | 156.8 | 2.38 | V | |
| 1909.374 | 14.1 | 151.2 | 2.35 | III | |
| .387 | 12.5 | 150.6 | 2.40 | VII | |
| .407 | 14.9 | 148.7 | 2.37 | III | |
| 1910.439 | 13.8 | 140.9 | 2.32 | VII | |
| .508 | 16.6 | 139.6 | 2.28 | VI | Good. |
| 1912.472 | 16.3 | 125.5 | 2.33 | VI | |
| .500 | 16.5 | 123.4 | 2.06 | VII | Very blurred. |
| 1913.472 | 15.0 | 115.2 | 2.15 | VII | |
| .483 | 16.0 | 116.3 | 2.01 | VI | |
| 1914.461 | 16.9 | 110.6 | 1.76 | 12 | Through clouds |
| .491 | 14.9 | 105.8 | 2.32 | 12 | |
| .500 | 15.4 | 105.4 | 2.15 | 9 | |
| 1915.409 | 12.6 | 101.1 | 2.15 | 7 | |
| .411 | 13.5 | 101.7 | 2.10 | 9 | |
| .606 | 17.6 | 99.9 | 2.15 | 7 | |
| 1916.360 | 12.4 | 95.0 | 2.42 | 12 | |
| .390 | 13.7 | 90.7 | 2.31 | 7 | |
| .409 | 12.9 | 95.4 | 2.33 | 9 | |
| .513 | 16.7 | 95.5 | 2.32 | 12 | |
| 1917.352 | 13.2 | 85.5 | 2.17 | 12 | |
| .365 | 13.0 | 87.1 | 2.16 | 7 | |
| .368 | 11.8 | 86.8 | 2.25 | 12 | |

OBSERVATIONS OF DOUBLE STARS

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece | Remarks |
|--------------------------|----------|----------|----------|-----------|-------------|
| | <i>h</i> | <i>°</i> | <i>"</i> | | |
| ξ Bootis, 7034—Continued | | | | | |
| 1918.387 | 12.7 | 77.1 | 2.31 | 7 | Bad seeing. |
| .442 | 14.2 | 77.8 | 2.43 | 7 | |
| .501 | 14.8 | 77.6 | 2.27 | 7 | |
| .521 | 15.3 | 78.3 | 2.20 | 7 | |
| 1919.313 | 10.9 | 74.0 | 2.68 | 7 | |
| .379 | 11.8 | 70.9 | 2.66 | V | |
| .491 | 15.4 | 71.1 | 2.48 | 7 | |
| 1892.49 | 3 n | 238.30 | 2.91 | | |
| 1895.49 | 3 | 226.37 | 2.88 | | |
| 1896.49 | 3 | 222.70 | 2.80 | | |
| 1897.50 | 2 | 216.25 | 2.90 | | |
| 1898.54 | 3 | 212.57 | 2.78 | | |
| 1899.54 | 3 | 208.63 | 2.77 | | |
| 1901.42 | 5 | 196.08 | 2.72 | | |
| 1902.51 | 4 | 192.18 | 2.63 | | |
| 1903.40 | 4 | 185.60 | 2.66 | | |
| 1904.57 | 3 | 181.10 | 2.54 | | |
| 1906.50 | 3 | 171.93 | 2.56 | | |
| 1907.56 | 3 | 162.07 | 2.44 | | |
| 1908.48 | 3 | 157.40 | 2.46 | | |
| 1909.39 | 3 | 150.17 | 2.37 | | |
| 1910.47 | 2 | 140.25 | 2.30 | | |
| 1912.49 | 2 | 124.45 | 2.20 | | |
| 1913.48 | 2 | 115.75 | 2.08 | | |
| 1914.48 | 3 | 107.27 | 2.08 | | |
| 1915.48 | 3 | 100.90 | 2.13 | | |
| 1916.42 | 4 | 94.15 | 2.34 | | |
| 1917.36 | 3 | 86.47 | 2.19 | | |
| 1918.46 | 4 | 77.70 | 2.30 | | |
| 1919.39 | 3 | 72.00 | 2.61 | | |

| Date | Sid. T. | p | s | Eyepiece | Remarks |
|-----------------------------------|---------|---------|------|----------|------------------|
| | h | ° | ' | | |
| O Σ 288, 7049 | | | | | |
| 14 ^h 48.7 ^m | | +16° 7' | | 6.4 | 7.5 |
| 1907.554 | 17.1 | 191.6 | 1.81 | VI | Good. |
| .563 | 16.9 | 190.7 | 1.79 | VI | |
| 1908.480 | 16.5 | 190.8 | 1.69 | III | |
| .491 | 16.4 | 188.3 | 1.48 | V | |
| 1909.387 | 12.8 | 186.7 | 1.67 | III | |
| .464 | 15.3 | 187.9 | 1.64 | VIII | |
| 1910.439 | 14.0 | 187.0 | 1.74 | VI | |
| .521 | 16.0 | 188.3 | 1.69 | VI | |
| 1912.472 | 16.5 | 188.1 | 1.86 | VI | |
| .521 | 15.9 | 186.9 | 1.69 | VI | |
| 1913.582 | 16.6 | 188.4 | 1.75 | VI | |
| .590 | 17.2 | 188.8 | 1.74 | VII | |
| .650 | 17.8 | 187.8 | 1.85 | VI | |
| 1914.491 | 15.1 | 186.4 | 1.59 | 7 | |
| .500 | 15.6 | 187.8 | 1.70 | 9 | |
| .519 | 17.0 | 186.7 | 1.91 | 12 | |
| 1915.411 | 14.2 | 188.6 | 1.75 | 9 | |
| .472 | 16.2 | 188.6 | 1.66 | 7 | |
| .486 | 15.7 | 186.8 | 1.98 | 12 | |
| 1916.357 | 11.7 | 185.9 | 1.44 | 12 | Very bad seeing. |
| .390 | 13.9 | 185.5 | 1.58 | 12 | |
| .412 | 13.3 | 185.5 | 1.42 | 12 | |
| 1917.368 | 12.0 | 186.4 | 1.53 | 9 | |
| .374 | 11.8 | 186.6 | 1.75 | 9 | |
| .377 | 11.8 | 187.2 | 1.45 | 12 | |

OBSERVATIONS OF DOUBLE STARS

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece | Remarks |
|--------------------------------|---------|----------|----------|-----------|--------------|
| | h | ° | " | | |
| O Σ 288, 7049—Continued | | | | | |
| 1918.387 | 12.8 | 185.4 | 1.71 | 9 | |
| .412 | 13.0 | 186.7 | 1.66 | 7 | |
| .521 | 15.5 | 186.9 | 1.66 | 7 | |
| 1919.374 | 13.5 | 184.8 | 1.81 | 7 | |
| .379 | 12.0 | 185.9 | 1.41 | 7 | |
| .510 | 15.5 | 185.2 | 1.48 | 7 | Poor seeing. |
| 1902.51 | 3 n | 190.60 | 1.55 | | |
| 1903.39 | 3 | 187.47 | 1.56 | | |
| 1904.59 | 3 | 190.63 | 1.66 | | |
| 1906.51 | 3 | 190.63 | 1.69 | | |
| 1907.56 | 2 | 191.15 | 1.80 | | |
| 1908.49 | 2 | 189.55 | 1.58 | | |
| 1909.43 | 2 | 187.30 | 1.66 | | |
| 1910.48 | 2 | 187.65 | 1.71 | | |
| 1912.50 | 2 | 187.50 | 1.77 | | |
| 1913.61 | 3 | 188.33 | 1.78 | | |
| 1914.50 | 3 | 186.97 | 1.73 | | |
| 1915.46 | 3 | 188.00 | 1.80 | | |
| 1916.39 | 3 | 185.63 | 1.48 | | |
| 1917.37 | 3 | 186.73 | 1.58 | | |
| 1918.44 | 3 | 186.33 | 1.68 | | |
| 1919.42 | 3 | 185.30 | 1.57 | | |

 Σ 1909, 7120

| 15 \pm 0.5 ^m | | +48° 3' | | 5.0 6.0 | |
|---------------------------|------|---------|------|---------|-------------|
| 1915.606 | 17.8 | 244.0 | 4.05 | 7 | |
| .609 | 17.2 | 245.4 | 3.94 | 7 | |
| 1916.357 | 11.4 | 245.7 | 3.96 | 12 | Bad seeing. |
| .360 | 12.7 | 245.4 | 3.82 | 12 | |
| .409 | 13.1 | 245.4 | 3.79 | 9 | |

| Date | Sid. T. | p | s | Eyepiece | Remarks |
|------|---------|-----|-----|----------|---------|
| | h | ° | " | | |

 Σ 1909, 7120—Continued

| | | | | | |
|----------|------|--------|------|----|--|
| 1917.368 | 12.2 | 243.5 | 3.86 | 9 | |
| .374 | 12.0 | 244.4 | 3.77 | 9 | |
| .377 | 11.6 | 244.7 | 3.78 | 12 | |
| 1918.387 | 13.0 | 243.7 | 3.86 | 9 | |
| .423 | 13.2 | 243.5 | 3.82 | 9 | |
| .628 | 18.9 | 244.7 | 3.63 | 12 | |
| 1919.313 | 11.1 | 243.6 | 3.89 | 7 | |
| .379 | 12.2 | 244.9 | 3.67 | 12 | |
| .552 | 16.7 | 243.9 | 3.72 | 7 | |
| 1892.58 | 2 n | 241.30 | 4.84 | | |
| 1895.49 | 3 | 241.13 | 4.72 | | |
| 1915.61 | 2 | 244.70 | 4.00 | | |
| 1916.38 | 3 | 245.50 | 3.86 | | |
| 1917.37 | 3 | 244.20 | 3.80 | | |
| 1918.48 | 3 | 243.93 | 3.77 | | |
| 1919.41 | 3 | 244.13 | 3.76 | | |

 Σ 1932, 721415^h 14.1^m

+27° 14'

6.8 6.9

| | | | | | |
|----------|------|-------|------|------|--|
| 1907.554 | 17.2 | 344.3 | 0.54 | VII | |
| .565 | 17.9 | 340.4 | 0.64 | VII | |
| 1908.519 | 17.0 | 344.6 | 0.67 | VII | |
| .521 | 15.7 | 349.8 | 0.63 | VII | |
| .541 | 16.5 | 352.0 | 0.61 | VIII | |
| 1909.560 | 17.9 | 347.2 | 0.65 | VII | |
| 1910.527 | 17.0 | 351.9 | 0.64 | VII | |
| .541 | 16.7 | 354.5 | 0.66 | VII | |

| Date | Sid. T. | p | s | Eye-piece | Remarks |
|------|---------|-----|-----|-----------|---------|
| | h | ° | " | | |

 Σ 1932, 7214—Continued

| | | | | | |
|----------|------|--------|------|-----|------------------------|
| 1911.721 | 19.3 | 354.3 | 0.71 | VII | |
| .724 | 19.5 | 349.5 | 0.68 | VII | |
| 1913.513 | 16.4 | 0.6 | 0.62 | VII | |
| .552 | 17.2 | 2.4 | 0.75 | VI | |
| 1914.474 | 14.5 | 357.7 | 0.57 | 7 | |
| .500 | 17.7 | 359.6 | 0.74 | 7 | Very blurred. |
| 1915.472 | 16.4 | 4.9 | 0.61 | 7 | |
| .486 | 16.6 | 5.7 | 0.68 | 7 | |
| 1916.390 | 14.2 | 5.6 | 0.63 | 7 | |
| .393 | 13.0 | 4.4 | 0.62 | 7 | |
| .428 | 13.8 | 2.2 | 0.52 | 7 | Very bad seeing. |
| 1917.374 | 12.2 | 8.2 | 0.59 | 7 | Very bad seeing. |
| .377 | 12.1 | 4.8 | 0.47 | 7 | Blurred and difficult. |
| .390 | 14.1 | 6.9 | 0.64 | 7 | |
| 1918.431 | 14.6 | 8.6 | 0.64 | 7 | |
| .501 | 15.6 | 190.1 | 0.60 | 7 | |
| .510 | 16.2 | 10.3 | 0.63 | 7 | |
| 1919.374 | 13.7 | 190.1 | 0.62 | 7 | |
| .396 | 13.7 | 193.1 | 0.57 | 7 | |
| .491 | 15.5 | 193.0 | 0.53 | 7 | |
| 1892.86 | 5 n | 319.50 | 0.71 | | |
| 1895.50 | 3 | 324.13 | .70 | | |
| 1896.42 | 3 | 324.23 | .66 | | |
| 1897.42 | 3 | 325.67 | .80 | | |
| 1898.53 | 3 | 326.60 | .66 | | |
| 1899.53 | 3 | 328.40 | .69 | | |
| 1901.46 | 3 | 333.50 | .70 | | |
| 1902.52 | 3 | 335.53 | .66 | | |

| Date | Sid. T. | p | s | Eyepiece | Remarks |
|------|---------|-----|-----|----------|---------|
| h | ° | " | | | |

 Σ 1932, 7214—Continued

| | | | | | |
|---------|---|--------|------|--|--|
| 1903.38 | 3 | 335.17 | 0.65 | | |
| 1904.59 | 3 | 338.13 | .59 | | |
| 1906.50 | 3 | 345.27 | .76 | | |
| 1907.56 | 2 | 342.35 | .59 | | |
| 1908.53 | 3 | 348.80 | .64 | | |
| 1910.21 | 3 | 351.20 | .65 | | |
| 1911.72 | 2 | 351.90 | .70 | | |
| 1913.53 | 2 | 361.50 | .68 | | |
| 1914.49 | 2 | 358.65 | .66 | | |
| 1915.48 | 2 | 5.80 | .64 | | |
| 1916.40 | 3 | 4.07 | .59 | | |
| 1917.38 | 3 | 6.63 | .57 | | |
| 1918.48 | 3 | 9.67 | .62 | | |
| 1919.42 | 3 | 12.07 | .57 | | |

 η Coronae Borealis, 725115^b 19.1^m

+30°40'

5.7 6.2

| | | | | | |
|----------|------|------|------|------|----------------|
| 1907.554 | 17.4 | 31.5 | 1.03 | VII | |
| .565 | 18.1 | 28.6 | 1.11 | VI | |
| .571 | 17.3 | 30.6 | 1.14 | VII | |
| 1908.483 | 16.5 | 31.4 | 1.15 | VI | |
| .491 | 16.6 | 32.6 | 0.90 | VI | |
| .571 | 16.7 | 30.9 | 0.99 | VII | |
| 1909.480 | 17.0 | 37.0 | 1.05 | VI | Badly blurred. |
| .516 | 16.3 | 34.9 | 0.85 | VII | Blurred. |
| .535 | 17.7 | 38.2 | 0.90 | VIII | |
| 1910.508 | 16.8 | 37.8 | 1.00 | VIII | |
| .521 | 17.4 | 37.2 | 0.91 | VII | |
| .527 | 17.6 | 35.2 | 1.04 | VII | |

| Date | Sid. T. | p | s | Eyepiece | Remarks |
|------|---------|-----|-----|----------|---------|
| | h | ° | " | | |

 η Coronae Borealis, 7251—Continued

| | | | | | |
|----------|------|--------|------|-----|---------------|
| 1911.721 | 19.7 | 43.6 | 0.84 | VII | Blurred. |
| .724 | 19.9 | 43.8 | 0.91 | VII | |
| 1913.513 | 16.6 | 48.5 | 0.76 | VII | |
| .519 | 16.4 | 48.0 | 0.77 | VII | |
| .565 | 16.5 | 47.6 | 0.99 | VI | |
| 1914.474 | 14.3 | 51.5 | 0.78 | 7 | |
| .500 | 16.6 | 51.8 | 0.98 | 7 | |
| .508 | 17.4 | 51.4 | 0.88 | 7 | |
| 1915.411 | 14.4 | 56.5 | 0.73 | 9 | |
| .486 | 16.8 | 56.1 | 0.79 | 7 | |
| .606 | 18.0 | 57.3 | 0.78 | 7 | Good. |
| 1916.360 | 13.2 | 60.2 | 0.71 | 9 | |
| .393 | 13.2 | 62.3 | 0.71 | 7 | |
| .428 | 13.6 | 64.7 | 0.63 | 9 | |
| .628 | 18.0 | 60.2 | 0.72 | 7 | |
| 1917.352 | 13.5 | 69.9 | 0.68 | 7 | |
| .363 | 13.8 | 65.9 | 0.55 | 7 | |
| .368 | 12.4 | 70.8 | 0.64 | 7 | |
| .565 | 16.8 | 66.9 | 0.66 | 7 | |
| 1918.387 | 13.4 | 77.7 | 0.53 | 7 | Very blurred. |
| .423 | 13.6 | 77.6 | 0.61 | 7 | |
| .501 | 16.5 | 73.8 | 0.64 | 7 | |
| 1919.396 | 13.8 | 88.7 | 0.62 | 7 | |
| .491 | 15.7 | 83.4 | 0.59 | 7 | |
| .535 | 17.7 | 85.9 | 0.53 | 7 | |
| 1892.65 | 3 n | 229.83 | 0.48 | | |
| 1895.51 | 3 | 285.87 | .26 | | |
| 1896.52 | 4 | 314.18 | .38 | | |
| 1897.50 | 3 | 331.50 | .46 | | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece | Remarks |
|------|----------|----------|----------|-----------|---------|
| | <i>h</i> | <i>°</i> | <i>"</i> | | |

 η Coronae Borealis, 7251—Continued

| | | | | | |
|---------|---|--------|------|--|--|
| 1898.56 | 3 | 345.90 | 0.55 | | |
| 1899.53 | 3 | 353.80 | .69 | | |
| 1901.43 | 4 | 8.82 | .80 | | |
| 1902.54 | 3 | 11.93 | .83 | | |
| 1903.38 | 3 | 14.63 | .96 | | |
| 1904.57 | 3 | 21.00 | .96 | | |
| 1906.50 | 3 | 25.63 | 1.05 | | |
| 1907.56 | 3 | 30.23 | 1.10 | | |
| 1908.52 | 3 | 31.63 | 1.01 | | |
| 1909.51 | 3 | 36.70 | 0.93 | | |
| 1910.52 | 3 | 36.73 | .98 | | |
| 1911.72 | 2 | 43.70 | .88 | | |
| 1913.53 | 3 | 48.03 | .84 | | |
| 1914.49 | 3 | 51.57 | .88 | | |
| 1915.53 | 3 | 56.63 | .77 | | |
| 1916.47 | 4 | 61.85 | .69 | | |
| 1917.41 | 4 | 68.38 | .63 | | |
| 1918.44 | 3 | 76.37 | .59 | | |
| 1919.47 | 3 | 86.00 | .58 | | |

 μ^3 Bootis, 725915^h 20.7^m

+37° 42'

6.7 7.1

| | | | | | |
|----------|------|------|------|-----|-------|
| 1907.554 | 17.6 | 62.4 | 1.04 | VII | |
| .565 | 18.6 | 64.2 | 1.10 | VI | |
| 1908.480 | 16.9 | 62.3 | 1.09 | VI | |
| .483 | 17.1 | 62.0 | 1.01 | VI | Good. |
| .584 | 17.1 | 63.0 | 0.84 | VII | |
| Ob 6 | | | | | |

OBSERVATIONS OF DOUBLE STARS

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece | Remarks |
|------|---------|----------|----------|----------|---------|
| | h | ° | " | | |

 μ^2 Bootis, 7259—Continued

| | | | | | |
|----------|------|-------|------|-----|-------------|
| 1909.387 | 13.1 | 242.8 | 1.11 | VI | |
| .521 | 17.3 | 60.8 | 0.87 | VI | |
| .560 | 18.4 | 60.2 | 1.03 | VII | |
| 1910.527 | 17.4 | 58.7 | 1.08 | VII | |
| .541 | 16.8 | 60.2 | 1.00 | VII | |
| .546 | 18.3 | 59.8 | 1.00 | VI | |
| 1911.721 | 19.8 | 57.8 | 1.09 | VII | |
| .724 | 20.3 | 58.9 | 1.17 | VII | |
| 1913.552 | 17.4 | 56.6 | 1.21 | VI | |
| .557 | 17.2 | 56.8 | 1.13 | VI | |
| 1914.497 | 17.1 | 54.6 | 1.06 | 7 | |
| .500 | 16.8 | 54.4 | 1.37 | 7 | |
| .516 | 17.2 | 54.6 | 1.22 | 12 | |
| 1915.508 | 16.9 | 53.6 | 1.35 | 7 | |
| .538 | 17.5 | 53.8 | 1.36 | 7 | |
| .606 | 18.6 | 53.6 | 1.33 | 7 | |
| 1916.360 | 13.0 | 50.6 | 1.21 | 9 | |
| .393 | 13.4 | 53.0 | 1.38 | 7 | |
| .412 | 13.6 | 54.0 | 1.07 | 12 | Bad seeing. |
| .634 | 18.0 | 51.8 | 1.29 | 7 | Good. |
| 1917.363 | 14.0 | 48.2 | 1.05 | 7 | |
| .365 | 12.7 | 53.4 | 1.12 | 7 | |
| .368 | 12.7 | 52.2 | 1.20 | 7 | |
| 1918.423 | 13.4 | 51.3 | 1.24 | 9 | Good. |
| .516 | 16.9 | 50.5 | 1.32 | 7 | Good. |
| .568 | 16.8 | 51.5 | 1.22 | 7 | |

| Date | Sid. T. | p | s | Eye-piece | Remarks |
|------|---------|-----|-----|-----------|---------|
| | h | ° | " | | |

 μ^2 Bootis, 7259—Continued

| | | | | | |
|----------|------------|-------|------|---|-------|
| 1919.379 | 12.4 | 48.8 | 1.39 | 7 | Good. |
| .535 | 17.4 | 49.0 | 1.36 | 7 | |
| .541 | 16.6 | 46.5 | 1.35 | 7 | |
| 1890.27 | 2 <i>n</i> | 97.35 | 0.66 | | |
| 1892.58 | 4 | 89.10 | .69 | | |
| 1895.53 | 3 | 83.87 | .64 | | |
| 1896.49 | 3 | 83.10 | .73 | | |
| 1897.64 | 3 | 78.33 | .80 | | |
| 1898.56 | 3 | 77.00 | .73 | | |
| 1899.53 | 3 | 75.37 | .88 | | |
| 1901.47 | 3 | 75.40 | .90 | | |
| 1902.54 | 3 | 72.00 | .80 | | |
| 1903.38 | 3 | 70.90 | 1.05 | | |
| 1904.56 | 2 | 67.05 | .90 | | |
| 1906.53 | 3 | 64.63 | 1.01 | | |
| 1907.56 | 2 | 63.30 | 1.07 | | |
| 1908.52 | 3 | 62.43 | .98 | | |
| 1909.49 | 3 | 61.27 | 1.00 | | |
| 1910.54 | 3 | 59.57 | 1.03 | | |
| 1911.72 | 2 | 58.35 | 1.13 | | |
| 1913.55 | 2 | 56.70 | 1.17 | | |
| 1914.50 | 3 | 54.53 | 1.22 | | |
| 1915.55 | 3 | 53.67 | 1.35 | | |
| 1916.45 | 4 | 52.35 | 1.24 | | |
| 1917.36 | 3 | 51.27 | 1.12 | | |
| 1918.50 | 3 | 51.10 | 1.26 | | |
| 1919.48 | 3 | 48.10 | 1.37 | | |

OBSERVATIONS OF DOUBLE STARS

| Date | Sid. T. | p | s | Eyepiece | Remarks |
|------|---------|-----|-----|----------|---------|
| | h | ° | ' | | |

O Σ 298, 733215^h 32.5^m

+40° 8'

7.0 7.2

| | | | | | |
|----------|------|-------|------|-----|---------------------------|
| 1907.554 | 17.7 | 187.2 | 1.27 | VII | Good. |
| .565 | 18.7 | 186.6 | 1.40 | VI | |
| 1908.483 | 17.2 | 190.3 | 1.08 | VI | |
| .519 | 17.4 | 9.1 | 1.31 | VII | |
| 1909.560 | 18.1 | 187.6 | 1.19 | VII | |
| .574 | 17.6 | 188.9 | 1.00 | VI | |
| 1910.521 | 17.7 | 192.2 | 1.08 | VI | |
| .527 | 17.9 | 189.0 | 1.25 | VII | |
| 1911.721 | 20.0 | 191.4 | 1.28 | VII | |
| .724 | 20.5 | 192.1 | 1.05 | VII | |
| 1913.552 | 17.7 | 195.1 | 1.32 | VI | |
| .557 | 17.4 | 194.4 | 1.11 | VI | |
| .565 | 17.7 | 194.2 | 1.10 | VII | |
| 1914.497 | 17.3 | 196.2 | 1.21 | 7 | |
| .500 | 17.2 | 199.1 | 1.24 | 7 | |
| .566 | 17.8 | 196.0 | 1.18 | 7 | |
| 1915.538 | 17.8 | 194.8 | 1.09 | 7 | |
| .595 | 17.4 | 195.8 | 1.01 | 9 | |
| .606 | 18.4 | 198.5 | 0.98 | 7 | |
| 1916.393 | 13.6 | 196.6 | 0.91 | 7 | |
| .412 | 13.9 | 193.2 | 0.87 | 9 | |
| .445 | 13.6 | 197.4 | 0.95 | 12 | |
| 1917.368 | 12.9 | 198.0 | 0.78 | 7 | Very bad seeing. Good. |
| .390 | 14.2 | 200.0 | 0.91 | 7 | |
| .396 | 13.3 | 196.9 | 0.89 | 7 | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece | Remarks |
|------|---------|----------|----------|----------|---------|
| | h | ° | ' | | |

O Σ 298, 7332—Continued

| | | | | | |
|----------|------|--------|------|---|-------------------------------|
| 1918.387 | 13.2 | 198.2 | 0.77 | 9 | Good. Very bad seeing. |
| .423 | 13.8 | 197.5 | 0.75 | 7 | |
| .568 | 17.3 | 202.6 | 0.80 | 7 | |
| 1919.379 | 12.9 | 205.1 | 0.80 | 7 | |
| .516 | 17.1 | 203.6 | 0.77 | 7 | |
| .535 | 17.5 | 204.9 | 0.84 | 7 | |
| 1892.80 | 5 n | 169.82 | 0.64 | | |
| 1895.54 | 3 | 173.13 | .85 | | |
| 1896.49 | 3 | 178.87 | .79 | | |
| 1897.64 | 3 | 176.33 | 1.02 | | |
| 1898.58 | 3 | 177.07 | 0.98 | | |
| 1899.53 | 3 | 179.90 | 1.11 | | |
| 1901.47 | 3 | 182.20 | 1.13 | | |
| 1902.54 | 3 | 182.13 | 1.09 | | |
| 1903.38 | 3 | 183.73 | 1.17 | | |
| 1904.60 | 2 | 184.45 | 1.16 | | |
| 1906.58 | 3 | 186.77 | 1.19 | | |
| 1907.56 | 2 | 186.90 | 1.33 | | |
| 1908.50 | 2 | 189.70 | 1.20 | | |
| 1909.57 | 2 | 188.25 | 1.10 | | |
| 1910.52 | 2 | 190.60 | 1.16 | | |
| 1911.72 | 2 | 191.75 | 1.16 | | |
| 1913.56 | 3 | 194.57 | 1.18 | | |
| 1914.52 | 3 | 197.10 | 1.21 | | |
| 1915.58 | 3 | 196.37 | 1.03 | | |
| 1916.42 | 3 | 195.67 | 0.91 | | |
| 1917.38 | 3 | 198.30 | .86 | | |
| 1918.46 | 3 | 199.43 | .77 | | |
| 1919.48 | 3 | 204.53 | 80 | | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece | Remarks |
|-----------------------------------|---------|----------|----------|----------|----------------|
| | h | ° | ' | | |
| γ Coronae Borealis, 7368 | | | | | |
| 15 ^m 38.6 ^m | | +26° 37' | | 3.9 7.0 | |
| 1907.554 | 19.9 | 112.6 | 0.67 | VII | |
| .565 | 18.9 | 113.9 | 0.68 | VII | |
| .571 | 17.1 | 113.3 | 0.46 | VII | |
| 1908.483 | 16.7 | 117.1 | 0.84 | VI | |
| .513 | 15.7 | 114.7 | 0.60 | VI | |
| .535 | 15.8 | 114.6 | 0.66 | VII | Bad seeing. |
| 1909.374 | 14.2 | 119.0 | 0.72 | VII | Bad seeing. |
| .466 | 14.6 | 120.0 | 0.64 | VIII | Very bad. |
| .541 | 16.7 | 113.1 | 0.76 | VIII | Thro clouds |
| 1910.508 | 17.0 | 113.5 | 0.65 | VIII | |
| .527 | 17.2 | 112.4 | 0.65 | VII | |
| .546 | 18.1 | 111.5 | 0.75 | VI | |
| 1911.721 | 19.5 | 114.4 | 0.66 | VII | |
| .724 | 20.1 | 115.0 | 0.72 | VII | |
| 1913.513 | 16.9 | 112.2 | 0.74 | VII | |
| .519 | 16.6 | 115.0 | 0.70 | VII | Blasing. |
| 1914.474 | 14.0 | 119.7 | 0.60 | 7 | |
| .500 | 17.0 | 114.1 | 0.73 | 7 | |
| .516 | 17.6 | 114.1 | 0.66 | 7 | Very blurred. |
| 1915.411 | 14.6 | 117.0 | 0.70 | 7 | Badly blurred. |
| .538 | 17.9 | 112.1 | 0.51 | 7 | |
| .606 | 18.2 | 115.7 | 0.66 | 7 | |
| 1916.393 | 13.8 | 111.6 | 0.97 | 7 | |
| .445 | 13.1 | 113.9 | 0.63 | 7 | |
| .461 | 14.2 | 114.4 | 0.68 | 7 | |
| 1917.363 | 13.7 | 115.6 | 0.61 | 7 | |
| .365 | 13.2 | 116.8 | 0.59 | 7 | Very blurred. |
| .396 | 12.9 | 112.4 | 0.67 | 7 | Bad seeing. |

| Date | Sid. T. | p | s | Eyepeice | Remarks |
|------|---------|-----|-----|----------|---------|
| | h | ° | " | | |

 γ Coronae Borealis, 7368—Continued

| | | | | | |
|----------|------|--------|------|---|------------------|
| 1918.387 | 13.6 | 112.7 | 0.70 | 7 | Very bad seeing. |
| .423 | 14.1 | 114.6 | 0.72 | 7 | Bad seeing. |
| .568 | 17.1 | 115.1 | 0.57 | 7 | Blurred. |
| 1919.396 | 14.0 | 116.3 | 0.61 | 7 | Very blurred. |
| .491 | 15.9 | 112.3 | 0.58 | 7 | Blurred. |
| .521 | 16.2 | 110.5 | 0.60 | 7 | |
| 1892.73 | 3 n | 121.97 | 0.40 | | |
| 1895.55 | 3 | 117.10 | .43 | | |
| 1896.62 | 4 | 122.40 | .46 | | |
| 1897.60 | 3 | 120.43 | .58 | | |
| 1898.56 | 3 | 120.50 | .53 | | |
| 1899.53 | 3 | 120.30 | .67 | | |
| 1901.46 | 4 | 120.80 | .60 | | |
| 1902.52 | 3 | 116.10 | .63 | | |
| 1903.39 | 3 | 116.83 | .74 | | |
| 1904.57 | 3 | 115.93 | .66 | | |
| 1906.50 | 3 | 117.87 | .66 | | |
| 1907.56 | 3 | 113.27 | .60 | | |
| 1908.51 | 3 | 115.47 | .70 | | |
| 1909.46 | 3 | 117.37 | .71 | | |
| 1910.53 | 3 | 112.47 | .68 | | |
| 1911.72 | 2 | 114.70 | .69 | | |
| 1913.52 | 2 | 113.60 | .72 | | |
| 1914.50 | 3 | 116.17 | .66 | | |
| 1915.52 | 3 | 114.93 | .62 | | |
| 1916.43 | 3 | 113.30 | .76 | | |
| 1917.38 | 3 | 114.60 | .62 | | |
| 1918.46 | 3 | 114.13 | .66 | | |
| 1919.47 | 3 | 113.03 | .60 | | |

| Date | Sid. T. | p | s | Eyepiece | Remarks |
|------|---------|-----|-----|----------|---------|
| | h | ° | ' | | |

 Σ 1989, 741615^h 45.1^m

+80° 18'

6.9 ...

| | | | | | |
|----------|------|-------|----------------|---------------------|---------|
| 1915.508 | 16.7 | ..... | ..... |  | Cannot. |
| 1916.628 | 18.1 | ..... | Suspect elonga | tion in 50°, 0''.25 | |
| 1897.66 | 1 n | 343.8 | 0.25 | | |
| 1900. | 3 | ? | ? | | |
| 1915. | 1 | ? | ? | | |
| 1916.63 | 1 | 50. ± | 0.25 est. | | |

O Σ 303, 747715^h 56.2^m

+13° 33'

7.0 7.4

| | | | | | |
|----------|------|--------|------|------|-------------|
| 1907.554 | 18.2 | 145.9 | 0.65 | VII | |
| .565 | 19.2 | 145.8 | 0.76 | VII | |
| 1908.483 | 16.9 | 149.9 | 0.98 | VI | |
| .519 | 16.7 | 150.2 | 0.91 | VII | |
| 1909.491 | 15.5 | 149.8 | 0.72 | VIII | Good. |
| .494 | 15.2 | 151.1 | 0.74 | VII | |
| 1910.609 | 17.6 | 147.5 | 0.65 | VII | Blurred. |
| 1912.521 | 16.2 | 150.9 | 0.77 | VI | |
| .524 | 15.7 | 152.0 | 0.69 | VII | |
| 1913.552 | 17.9 | 148.2 | 0.96 | VI | |
| .557 | 16.6 | 150.8 | 1.01 | VI | |
| 1916.390 | 14.4 | 150.9 | 0.70 | 7 | |
| .393 | 14.1 | 152.1 | 0.72 | 7 | |
| .466 | 14.7 | 151.6 | 0.83 | 7 | Good. |
| 1919.488 | 15.0 | 152.5 | 0.93 | 7 | Bad seeing. |
| .510 | 15.9 | 153.7 | 0.88 | 7 | |
| .521 | 16.1 | 153.4 | 0.75 | 7 | |
| 1902.54 | 3 n | 148.73 | 0.75 | | |
| 1903.39 | 3 | 144.83 | .74 | | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece | Remarks |
|------|----------|----------|----------|----------|---------|
| | <i>h</i> | <i>°</i> | <i>"</i> | | |

O Σ 303, 7477—Continued

| | | | | | |
|---------|---|--------|------|--|--|
| 1904.60 | 2 | 145.73 | 0.72 | | |
| 1906.50 | 2 | 148.80 | .74 | | |
| 1907.56 | 2 | 145.85 | .70 | | |
| 1908.50 | 2 | 150.05 | .94 | | |
| 1909.86 | 3 | 149.47 | .70 | | |
| 1912.52 | 2 | 151.45 | .74 | | |
| 1913.55 | 2 | 149.50 | .98 | | |
| 1916.42 | 3 | 151.53 | .75 | | |
| 1919.51 | 3 | 153.20 | .85 | | |

 ξ Scorpii, A B., 7487

| 15 ^h 58.9 ^m | | —11° 6' | | 5.5 5.6 7.4 | |
|-----------------------------------|------|---------|------------------|-------------|------------------------|
| 1908.519 | 16.4 | 302.9 | 0.36 | VII | Notched. |
| .521 | 15.8 | 307.0 | 0.35 <i>est.</i> | VII | Not separated. |
| 1909.480 | 15.4 | 322.7 | 0.30 <i>est.</i> | VIII | Elongated. |
| .491 | 15.1 | 321.9 | 0.30 <i>est.</i> | VIII | Notched. |
| .546 | 16.5 | ..... | Elongated in | 315° | Too bad to measure. |
| 1910.521 | 16.5 | 325.1 | 0.64 | VII | Separated by glimpses. |
| .574 | 16.7 | 335.7 | 0.54 | VII | Blurred. |
| 1912.532 | 16.7 | 339.7 | 0.66 | VII | Well separated. |
| .565 | 16.6 | 341.8 | 0.63 | VII | |
| 1913.584 | 17.2 | 345.2 | 0.68 | VII | |
| 1914.461 | 16.2 | 346.9 | 0.73 | 7 | |
| .474 | 15.8 | 346.7 | 0.68 | 7 | |
| .491 | 16.2 | 347.5 | 0.71 | 7 | |
| 1915.508 | 15.8 | 349.4 | 0.98 | 7 | |
| .524 | 16.6 | 350.2 | 0.69 | 7 | Bad seeing. |
| 1916.466 | 15.6 | 352.2 | 0.97 | 7 | |
| .480 | 15.7 | 351.9 | 0.85 | 9 | |

| Date | Sid. T. | p | s | Eye-piece | Remarks |
|---------------------------------|---------|--------|------|-----------|------------------|
| | h | ° | " | | |
| ξ Scorpii, A B., 7487—Continued | | | | | |
| 1916.486 | 16.2 | 353.0 | 0.82 | 7 | Very bad seeing. |
| 1917.457 | 14.4 | 353.4 | 0.87 | 9 | Bad seeing. |
| .469 | 14.7 | 352.9 | 0.70 | 7 | Very bad seeing. |
| .497 | 15.5 | 353.7 | 0.85 | 7 | Very bad seeing. |
| 1918.510 | 16.7 | 356.4 | 0.88 | 7 | |
| .568 | 16.3 | 356.1 | 0.89 | 9 | |
| .579 | 16.9 | 357.0 | 0.95 | 7 | |
| 1919.491 | 16.1 | 358.5 | 1.11 | 7 | |
| .516 | 16.7 | 358.8 | 0.90 | 7 | |
| .535 | 15.4 | 358.4 | 0.87 | 7 | |
| 1892.58 | 4 n | 26.48 | 0.82 | | |
| 1895.53 | 3 | 33.40 | .81 | | |
| 1896.65 | 2 | 37.60 | .75 | | |
| 1897.63 | 2 | 40.55 | .66 | | |
| 1898.58 | 3 | 43.13 | .55 | | |
| 1899.55 | 3 | 47.87 | .60 | | |
| 1901.46 | 3 | 58.57 | .52 | | |
| 1902.59 | 3 | 71.33 | .42 | | |
| 1903.55 | 3 | 90.10 | .30 | | |
| 1905. | 4 | ? | ? | | |
| 1908.52 | 2 | 304.95 | .36 | | |
| 1909.49 | 2 | 322.30 | .30 | | |
| 1910.55 | 2 | 335.40 | .59 | | |
| 1912.89 | 3 | 342.23 | .66 | | |
| 1914.47 | 3 | 347.03 | .71 | | |
| 1915.52 | 2 | 349.80 | .83 | | |
| 1916.48 | 3 | 353.37 | .88 | | |
| 1917.47 | 3 | 353.33 | .81 | | |
| 1918.55 | 3 | 356.50 | .91 | | |
| 1919.51 | 3 | 358.57 | .96 | | |

| Date | Sid. T. | p | s | Eye-piece | Remarks |
|------|---------|-----|-----|-----------|---------|
| | h | ° | " | | |

Idem $\frac{1}{2}(A+B)C$, 7487

| | | | | | |
|----------|------|-------|------|------|---------------------|
| 1908.519 | 16.5 | 61.0 | 7.53 | VII | |
| .521 | 16.0 | 59.8 | 6.90 | X | |
| 1909.480 | 15.5 | 58.9 | 7.49 | VI | |
| .491 | 15.3 | 61.5 | 7.43 | VIII | |
| .546 | 16.5 | 60.9 | 7.31 | VII | |
| 1910.521 | 16.9 | 62.4 | 7.38 | VII | |
| .574 | 16.8 | 60.7 | 7.35 | VII | |
| 1912.532 | 16.5 | 59.1 | 7.67 | VI | |
| .565 | 16.8 | 60.7 | 7.62 | VII | |
| 1913.584 | 17.4 | 60.6 | 7.28 | VII | |
| 1914.461 | 16.4 | 61.1 | 7.49 | 7 | |
| .474 | 16.0 | 58.0 | 7.13 | 7 | |
| .491 | 16.4 | 59.0 | 7.59 | V | |
| 1915.508 | 16.0 | 57.3 | 7.53 | 7 | AC+4.4° —0.16" |
| .524 | 16.7 | 66.5 | 7.00 | 7 | BC—4.4° +.16" |
| 1916.466 | 15.8 | 56.2 | 7.67 | 7 | AC+4.1—0.19 |
| .480 | 15.8 | 65.7 | 7.27 | 9 | BC—4.1° +.19" |
| .486 | 16.1 | 58.9 | 7.59 | V | $\frac{1}{2}(A+B)C$ |
| 1917.457 | 14.6 | 58.7 | 7.31 | V | $\frac{1}{2}(A+B)C$ |
| .469 | 14.8 | 59.7 | 7.52 | 9 | $\frac{1}{2}(A+B)C$ |
| .497 | 15.8 | 59.1 | 7.03 | 7 | $\frac{1}{2}(A+B)C$ |
| 1918.510 | 16.8 | 66.9 | 7.01 | 7 | BC—3.9+0.21" |
| .568 | 16.4 | 58.0 | 7.40 | 9 | AC+3.9—.21 |
| .579 | 17.0 | 57.7 | 7.60 | 7 | AC+3.9—.21 |
| 1919.491 | 16.2 | 65.3 | 7.25 | 7 | BC—3.6+.24 |
| .516 | 16.8 | 65.6 | 7.25 | 7 | BC—3.6+.24 |
| .535 | 15.6 | 55.5 | 7.62 | 7 | AC+3.6—.24 |
| 1892.58 | 3 n | 68.57 | 7.00 | | |
| 1895.53 | 3 | 65.33 | 7.26 | | |

| Date | Sid. T. | p | s | Eye-piece | Remarks |
|------|---------|-----|-----|-----------|---------|
| | h | ° | " | | |

Idem $\frac{1}{2}(A+B)C$, 7487—Continued

| | | | | | |
|---------|---|-------|------|--|--|
| 1896.58 | 3 | 63.70 | 7.41 | | |
| 1897.63 | 2 | 64.17 | 7.29 | | |
| 1898.58 | 4 | 64.13 | 7.17 | | |
| 1899.55 | 3 | 63.87 | 7.21 | | |
| 1901.45 | 2 | 62.40 | 7.36 | | |
| 1902.57 | 4 | 61.42 | 7.23 | | |
| 1903.53 | 3 | 61.80 | 7.26 | | |
| 1908.52 | 2 | 60.40 | 7.22 | | |
| 1909.51 | 3 | 60.43 | 7.41 | | |
| 1910.55 | 2 | 61.55 | 7.36 | | |
| 1912.89 | 3 | 60.13 | 7.52 | | |
| 1914.47 | 3 | 59.37 | 7.40 | | |
| 1915.52 | 2 | 61.90 | 7.28 | | |
| 1916.47 | 3 | 60.27 | 7.51 | | |
| 1917.47 | 3 | 59.17 | 7.29 | | |
| 1918.55 | 3 | 62.17 | 7.27 | | |
| 1919.51 | 3 | 60.93 | 7.45 | | |

 Σ 2021, 755116^h 8.6^m

+13° 48'

6.5 6.6

| | | | | | |
|----------|------|-------|------|-----|-------------|
| 1907.563 | 17.1 | 155.4 | 3.90 | VI | Bad seeing. |
| .571 | 17.4 | 154.1 | 4.09 | VII | Good. |
| 1908.494 | 15.9 | 335.8 | 3.93 | X | |
| .535 | 16.0 | 337.0 | 3.84 | X | |
| .565 | 16.8 | 336.6 | 3.61 | X | |
| 1909.584 | 17.4 | 336.9 | 3.95 | VI | |
| 1910.546 | 16.6 | 336.5 | 4.04 | VI | |
| .565 | 17.0 | 336.6 | 3.91 | V | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece | Remarks |
|------|---------|----------|----------|----------|---------|
| | h | ° | " | | |

Σ 2021, 7551—Continued

| | | | | | |
|----------|------|--------|------|-----|---------------|
| 1912.521 | 16.3 | 337.1 | 4.14 | VI | Very blurred. |
| .524 | 15.9 | 336.8 | 4.06 | VI | |
| 1913.579 | 16.7 | 337.9 | 3.95 | VI | |
| .590 | 17.4 | 336.8 | 4.01 | VII | |
| 1914.500 | 15.8 | 337.9 | 3.95 | 9 | |
| .508 | 16.4 | 337.8 | 3.84 | 12 | |
| .620 | 18.7 | 334.0 | 4.12 | 7 | |
| .620 | 18.9 | 335.3 | 3.89 | 30 | |
| 1915.486 | 16.2 | 337.4 | 3.92 | 12 | |
| .500 | 15.1 | 337.5 | 4.20 | 12 | |
| .603 | 17.4 | 337.9 | 4.07 | 7 | |
| 1916.360 | 14.1 | 338.0 | 3.99 | V | |
| .412 | 14.3 | 337.1 | 4.11 | V | |
| .453 | 13.8 | 336.7 | 4.08 | 9 | |
| 1917.368 | 13.3 | 337.1 | 4.01 | 12 | |
| .374 | 13.1 | 157.8 | 4.01 | 9 | |
| .439 | 13.7 | 339.6 | 3.89 | 7 | |
| 1918.648 | 18.5 | 337.6 | 3.94 | 7 | |
| .650 | 18.6 | 335.8 | 3.96 | 7 | |
| 1919.543 | 16.1 | 337.6 | 4.15 | 7 | |
| .549 | 16.1 | 338.3 | 4.05 | 7 | |
| .552 | 17.0 | 338.5 | 4.07 | 7 | |
| 1895.72 | 4 n | 332.78 | 3.91 | | |
| 1902.63 | 4 | 332.95 | 3.70 | | |
| 1903.40 | 3 | 334.90 | 4.05 | | |
| 1906.56 | 2 | 336.45 | 3.96 | | |
| 1907.57 | 2 | 334.75 | 4.00 | | |
| 1908.53 | 3 | 336.47 | 3.79 | | |
| 1910.32 | 3 | 336.80 | 3.97 | | |

OBSERVATIONS OF DOUBLE STARS

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece | Remarks |
|------|---------|----------|----------|----------|---------|
| | h | ° | ' | | |

 Σ 2021, 7551—Continued

| | | | | | |
|---------|---|--------|------|--|--|
| 1912.52 | 2 | 336.95 | 4.10 | | |
| 1913.58 | 2 | 337.35 | 3.98 | | |
| 1914.56 | 4 | 336.25 | 3.95 | | |
| 1915.53 | 3 | 337.60 | 4.06 | | |
| 1916.41 | 3 | 337.27 | 4.06 | | |
| 1917.39 | 3 | 338.17 | 3.97 | | |
| 1918.65 | 2 | 336.70 | 3.95 | | |
| 1919.55 | 3 | 338.13 | 4.09 | | |

 Σ 2026, 756116^b 11.0^m

+7° 38'

8.5 9.2

| | | | | | |
|----------|------|-------|------------------|----------|------------------------|
| 1909.480 | 15.7 | ..... | Suspect faint | comes in | 160°, 0.6'' |
| .560 | 18.5 | ..... | .... |  | Cannot see |
| 1914.491 | 16.8 | 101.5 | 0.36 | 7 | Barely separated. |
| .500 | 16.1 | 105.4 | 0.42 | 7 | Difficult, Barely sep. |
| .546 | 18.5 | 101.8 | 0.36 | 7 | |
| 1915.508 | 17.1 | 95.9 | 0.43 | 7 | |
| .595 | 17.8 | 103.7 | 0.35 <i>est.</i> | 9 | Notched. |
| 1916.393 | 14.2 | 99.1 | 0.35 <i>est.</i> | 7 | Separated by glimpses |
| .513 | 17.0 | 92.3 | 0.48 | 7 | Barely separated. |
| .516 | 16.7 | 90.4 | 0.45 | 7 | |
| 1917.557 | 18.1 | 85.2 | 0.52 | 7 | Very difficult. |
| .565 | 17.0 | 83.0 | 0.47 | 7 | Good. |
| .589 | 17.3 | 84.3 | 0.49 | 7 | |
| 1918.431 | 14.9 | 75.9 | 0.40 <i>est.</i> | 7 | Faint and difficult |
| .568 | 17.6 | 77.5 | 0.35 | 7 | Separated by glimpses |
| .595 | 18.5 | 70.6 | 0.40 <i>est.</i> | 7 | Doubtful separation. |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece | Remarks |
|------|----------|----------|----------|----------|---------|
| | <i>h</i> | <i>•</i> | <i>•</i> | | |

 Σ 2026, 7561—Continued

| | | | | | |
|----------|------------|--------|------|---|--|
| 1919.541 | 16.9 | 74.0 | 0.63 | 7 | |
| .637 | 18.9 | 71.7 | .58 | 7 | |
| 1909.52 | 2 <i>n</i> | ? | ? | | |
| 1914.51 | 3 | 102.90 | 0.38 | | |
| 1915.55 | 2 | 100.47 | .38 | | |
| 1916.47 | 3 | 93.93 | .43 | | |
| 1917.57 | 3 | 84.17 | .49 | | |
| 1918.53 | 3 | 74.67 | .38 | | |
| 1919.59 | 2 | 72.85 | .60 | | |

 δ Coronae, 756316^h 10.9^m

+34° 7'

5.8 6.7

| | | | | | |
|----------|------|-------|------|-----|-----------|
| 1913.565 | 17.3 | 217.2 | 4.92 | VI | |
| .590 | 17.6 | 218.7 | 5.00 | VII | |
| .650 | 18.5 | 218.8 | 4.96 | VI | |
| 1914.474 | 14.8 | 216.8 | 4.98 | 7 | |
| .516 | 15.3 | 215.7 | 4.93 | 12 | |
| .582 | 18.0 | 217.7 | 4.93 | 7 | |
| 1915.411 | 14.8 | 216.8 | 4.97 | 12 | |
| .609 | 17.6 | 217.0 | 5.03 | 7 | |
| 1916.360 | 13.9 | 216.0 | 4.97 | V | |
| .412 | 14.0 | 215.2 | 5.08 | V | |
| .453 | 13.7 | 215.0 | 4.92 | 9 | Daylight. |
| 1917.368 | 13.0 | 217.9 | 4.99 | V | |
| .374 | 12.9 | 217.1 | 5.12 | 9 | |
| .401 | 13.1 | 215.8 | 5.09 | 7 | |

OBSERVATIONS OF DOUBLE STARS

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece | Remarks |
|------|----------|----------|----------|-----------|---------|
| | <i>h</i> | <i>°</i> | <i>"</i> | | |

 δ Coronae, 7563—Continued

| | | | | | |
|----------|------------|--------|------|---|--|
| 1918.648 | 18.7 | 218.1 | 5.09 | 7 | |
| .650 | 18.9 | 219.4 | 5.23 | 7 | |
| 1892.62 | 3 <i>n</i> | 209.87 | 4.06 | | |
| 1895.72 | 4 | 210.08 | 4.28 | | |
| 1901.46 | 3 | 212.20 | 4.32 | | |
| 1902.63 | 3 | 214.70 | 4.42 | | |
| 1903.40 | 3 | 211.83 | 4.64 | | |
| 1913.60 | 3 | 218.23 | 4.96 | | |
| 1914.52 | 3 | 216.73 | 4.95 | | |
| 1915.51 | 2 | 216.90 | 5.00 | | |
| 1916.41 | 3 | 215.40 | 4.99 | | |
| 1917.38 | 3 | 216.93 | 5.07 | | |
| 1918.65 | 2 | 218.75 | 5.16 | | |

 β 815, 764016^h 23.9^m

+43° 8'

8.0 10.3

| | | | | | |
|----------|------------|--------|-------|---|------------|
| 1907.614 | 18.1 | 335.54 | 10.08 | X | Difficult. |
| .645 | 18.4 | 336.49 | 10.04 | V | |
| 1908.628 | 19.0 | 337.35 | 10.64 | X | |
| .729 | 21.2 | 335.11 | 10.46 | X | |
| 1909.582 | 18.3 | 335.14 | 10.34 | X | |
| 1903.43 | 3 <i>n</i> | 339.35 | 9.39 | | |
| 1907.63 | 2 | 336.36 | 10.06 | | |
| 1908.98 | 3 | 336.00 | 10.48 | | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece | Remarks |
|------|---------|----------|----------|-----------|---------|
| | h | ° | ' | | |

 Σ 2052, 764216^h 24.5^m

+18° 37'

7.6 7.8

| | | | | | |
|----------|------|-----------------|------------------|------|-------------------------------|
| 1907.563 | 17.3 | 88.3 | 1.15 | VI | |
| .571 | 18.3 | 86.2 | 1.24 | III | |
| 1908.494 | 16.1 | 87.4 | 0.99 | III | |
| .524 | 16.2 | 85.0 | 1.04 | III | |
| .535 | 16.2 | 85.6 | 1.13 | III | |
| 1909.480 | 15.8 | 84.8 | 0.91 | VIII | |
| .516 | 16.7 | 84.8 | 0.86 | VII | |
| 1910.546 | 16.9 | 84.0 | 0.89 | VI | |
| .565 | 17.2 | 83.6 | 0.89 | VI | |
| 1912.521 | 16.6 | 81.8 | 0.74 | VI | |
| .524 | 16.1 | 80.4 | 0.71 | VI | New perisustrom |
| 1913.557 | 17.7 | 76.9 | 0.77 | VI | |
| .565 | 16.8 | 76.0 | 0.78 | VII | |
| 1914.500 | 16.3 | 70.2 | 0.61 | 7 | |
| .508 | 16.6 | 74.8 | 0.59 | 7 | |
| .582 | 18.2 | 75.6 | 0.60 | 7 | |
| 1915.508 | 17.3 | 69.2 | 0.50 | 7 | |
| .595 | 18.0 | 67.8 | 0.44 | 7 | |
| 1916.445 | 13.9 | 64.2 | 0.50 <i>est.</i> | 7 | Barely separated. |
| .603 | 18.9 | 60.5 | 0.48 | 9 | Elongated. |
| 1917.404 | 13.1 | 44.5 | 0.30 <i>est.</i> | 7 | Elongated ? |
| .437 | 13.7 | 36.7 | 0.25 <i>est.</i> | 7 | Elongated. |
| .439 | 14.4 | 29.7 | 0.30 <i>est.</i> | 7 | Elongated. |
| 1918.431 | 15.0 | 20. <i>est.</i> | 0.20 <i>est.</i> | 7 | Doubtful elongation. |
| .501 | 16.7 | 358. | 0.20 <i>est.</i> | 7 | Doubtful elongation. |
| .510 | 16.5 | ..... | .... | 7 | Suspect elongation in 10°. |
| .516 | 17.4 | 1.6 | 0.20 <i>est.</i> | 7 | Doubtful elongation. |

Ob 7

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece | Remarks |
|------|----------|----------|----------|----------|---------|
| | <i>h</i> | <i>°</i> | <i>'</i> | | |

 Σ 2052, 7642—Continued

| | | | | | |
|----------|------------|--------|------------------|---|--------------------|
| 1919.541 | 17.1 | 331.6 | 0.25 <i>est.</i> | 7 | Slight elongation. |
| .637 | 19.1 | 300.9 | .25 <i>est.</i> | 7 | Difficult. |
| 1902.64 | 2 <i>n</i> | 91.05 | 1.55 | | |
| 1903.42 | 2 | 92.20 | 1.41 | | |
| 1906.54 | 2 | 88.45 | 1.13 | | |
| 1907.57 | 2 | 87.25 | 1.19 | | |
| 1908.52 | 3 | 86.00 | 1.05 | | |
| 1909.50 | 2 | 84.80 | 0.89 | | |
| 1910.56 | 2 | 83.80 | .89 | | |
| 1912.52 | 2 | 81.10 | .73 | | |
| 1913.56 | 2 | 76.45 | .78 | | |
| 1914.53 | 3 | 73.53 | .60 | | |
| 1915.55 | 2 | 68.50 | .47 | | |
| 1916.52 | 2 | 62.35 | .49 | | |
| 1917.43 | 3 | 36.97 | .28 | | |
| 1918.48 | 3 | 6.53 | .20 | | |
| 1919.52 | 2 | 316.25 | .25 | | |

 Σ 2055, 764916^h 25.9^m

+2° 12'

4.4 6.2

| | | | | | |
|----------|------|------|------|----|------------------|
| 1916.445 | 14.0 | 70.3 | 0.88 | 7 | Blurred. |
| .466 | 14.2 | 75.3 | 0.99 | 12 | Bad seeing. |
| .480 | 14.3 | 73.8 | 0.93 | 9 | Very blurred. |
| .688 | 19.1 | 74.7 | 0.92 | 9 | Very bad seeing. |
| 1917.390 | 14.4 | 79.0 | 0.90 | 7 | Very bad. |
| .396 | 13.1 | 78.1 | 0.88 | 7 | Good. |
| .404 | 14.1 | 75.8 | 1.02 | 9 | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece | Remarks |
|------|----------|----------|----------|----------|---------|
| | <i>h</i> | <i>°</i> | <i>"</i> | | |

 Σ 2055, 7649—Continued

| | | | | | |
|----------|------------|-------|------|---|------------------|
| 1918.472 | 14.2 | 72.8 | 0.84 | 7 | Bad seeing. |
| .524 | 15.7 | 78.8 | 0.85 | 7 | Very blurred. |
| .568 | 16.7 | 79.0 | 0.73 | 7 | Blurred. |
| 1919.488 | 15.2 | 80.4 | 0.88 | 7 | Bad seeing. |
| .491 | 16.5 | 80.8 | 0.89 | 7 | Very bad seeing. |
| .543 | 16.3 | 78.7 | 0.74 | 7 | Bad seeing. |
| 1892.68 | 3 <i>n</i> | 45.13 | 1.40 | | |
| 1895.52 | 3 | 47.63 | 1.28 | | |
| 1896.53 | 3 | 50.70 | 1.40 | | |
| 1916.52 | 4 | 73.52 | 0.93 | | |
| 1917.40 | 3 | 77.63 | .93 | | |
| 1918.52 | 3 | 75.93 | .80 | | |
| 1919.51 | 3 | 80.00 | .84 | | |

 β 817, 766916^h 28.7^m

+23° 28'

8.8 8.9

| | | | | | |
|----------|------|-------|------|-----|---------------|
| 1907.554 | 18.3 | 146.2 | 1.07 | VI | |
| .563 | 17.7 | 322.8 | 0.65 | VI | Very blurred. |
| 1908.513 | 16.3 | 330.7 | 1.20 | III | Bad seeing. |
| .521 | 16.2 | 329.6 | 1.29 | VI | |
| 1909.480 | 16.0 | 330.1 | 0.90 | VI | Good. |
| .546 | 16.8 | 331.0 | 0.89 | VII | Diffuse. |
| 1910.546 | 17.1 | 329.4 | 1.09 | VI | |
| .574 | 17.2 | 331.5 | 0.92 | VI | |
| 1912.521 | 16.8 | 329.2 | 0.88 | VI | |
| .532 | 17.2 | 330.1 | 1.05 | VI | Good. |

| Date | Sid. T. | p | s | Eyepiece | Remarks |
|------|---------|-----|-----|----------|---------|
| | h | ° | " | | |

 β 817, 7669—Continued

| | | | | | |
|----------|------|--------|------|----|--|
| 1913.557 | 18.1 | 327.1 | 1.00 | VI | |
| .565 | 17.1 | 328.8 | 1.02 | VI | |
| 1888.48 | 3 n | 327.60 | 1.14 | | |
| 1902.79 | 3 | 328.32 | 1.04 | | |
| 1907.56 | 2 | 324.50 | 0.86 | | |
| 1908.52 | 2 | 330.15 | 1.24 | | |
| 1909.51 | 2 | 330.55 | 0.90 | | |
| 1910.56 | 2 | 330.45 | 1.00 | | |
| 1912.53 | 2 | 329.65 | 0.96 | | |
| 1913.56 | 2 | 327.95 | 1.01 | | |

 ζ Hercules, 771716^h 37.6^m

+31° 47'

3.0 7.0

| | | | | | |
|----------|------|-------|------|-----|-----------------|
| 1907.554 | 18.5 | 174.0 | 1.43 | VI | Unsatisfactory. |
| .571 | 17.7 | 174.6 | 1.30 | VII | |
| .574 | 19.4 | 174.1 | 1.34 | VII | |
| 1908.549 | 17.2 | 166.5 | 1.34 | VII | |
| .565 | 17.3 | 165.1 | 1.43 | VII | |
| .571 | 18.4 | 160.5 | 1.40 | VII | |
| 1909.560 | 18.7 | 150.3 | 1.53 | VII | |
| .574 | 17.9 | 166.2 | 1.28 | VI | |
| 1910.546 | 17.7 | 141.3 | 1.22 | VI | |
| .574 | 17.9 | 141.3 | 1.39 | VI | |
| .576 | 17.9 | 142.0 | 1.19 | VI | |
| 1911.715 | 20.7 | 136.0 | 1.16 | VI | |
| .721 | 20.2 | 136.1 | 1.16 | VII | |
| 1912.524 | 18.0 | 130.4 | 1.47 | VI | |
| .532 | 17.9 | 129.7 | 1.26 | VI | |
| .565 | 18.5 | 129.4 | 1.45 | VII | |
| | | | | | Good. |
| | | | | | Blurred. |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece | Remarks |
|------|----------|----------|----------|-----------|---------|
| | <i>h</i> | <i>°</i> | <i>"</i> | | |

ζ Herculis, 7717—Continued

| | | | | | |
|----------|------|-------|------|-----|------------------|
| 1913.557 | 17.9 | 124.6 | 1.63 | VI | Good. |
| .571 | 16.8 | 124.4 | 1.42 | VI | |
| .582 | 18.5 | 123.8 | 1.22 | VII | |
| 1914.474 | 15.3 | 120.0 | 1.37 | 7 | |
| .491 | 15.4 | 117.9 | 1.30 | 7 | |
| .566 | 18.0 | 116.3 | 1.33 | 7 | |
| 1915.486 | 14.5 | 110.2 | 1.25 | 9 | |
| .595 | 18.2 | 111.3 | 1.41 | 7 | |
| .603 | 19.8 | 110.3 | 1.77 | 9 | |
| 1916.428 | 14.0 | 107.2 | 1.75 | 12 | Bad seeing. |
| .442 | 15.6 | 108.2 | 1.32 | 12 | Daylight. |
| .445 | 13.4 | 105.7 | 1.69 | 12 | |
| .461 | 14.4 | 109.1 | 1.96 | 12 | |
| .466 | 13.9 | 104.7 | 1.54 | 7 | Very bad seeing. |
| .617 | 18.0 | 107.8 | 1.47 | 9 | |
| 1917.377 | 12.9 | 99.7 | 1.58 | 12 | |
| .396 | 13.6 | 101.3 | 1.48 | 9 | |
| .401 | 14.0 | 101.8 | 1.63 | 7 | Blasing. |
| .404 | 13.4 | 103.3 | 1.53 | 7 | |
| 1918.431 | 15.1 | 97.3 | 1.67 | 7 | |
| .472 | 15.3 | 97.9 | 1.53 | 7 | |
| .595 | 18.3 | 98.9 | 1.52 | 9 | |
| 1919.535 | 15.8 | 91.7 | 1.69 | 7 | |
| .549 | 16.2 | 87.5 | 1.51 | 7 | |
| .552 | 15.7 | 90.8 | 1.54 | 7 | |
| 1920.462 | 14.8 | 86.6 | 1.42 | 7 | |
| 1888.57 | 3 n | 74.27 | 1.88 | | Very bad seeing. |
| 1889.56 | 4 | 71.95 | 1.67 | | |
| 1892.58 | 5 | 55.20 | 1.52 | | |

| Date | Sid. T. | p | s | Eyepiece | Remarks |
|------|---------|-----|-----|----------|---------|
| | h | ° | ' | | |

ζ Herculis, 7717—Continued

| | | | | | |
|---------|---|--------|------|--|--|
| 1895.57 | 4 | 30.25 | 0.98 | | |
| 1896.58 | 4 | 14.30 | 0.64 | | |
| 1897.63 | 1 | 352.0 | 0.20 | | |
| 1899.54 | 2 | 265.00 | 0.64 | | |
| 1901.51 | 5 | 225.34 | 0.94 | | |
| 1902.57 | 4 | 218.25 | 1.13 | | |
| 1903.45 | 4 | 202.18 | 1.23 | | |
| 1904.57 | 3 | 200.00 | 1.19 | | |
| 1905.72 | 2 | 192.20 | 1.19 | | |
| 1906.53 | 5 | 173.94 | 1.30 | | |
| 1907.57 | 3 | 174.23 | 1.36 | | |
| 1908.56 | 3 | 164.03 | 1.39 | | |
| 1909.57 | 2 | 158.25 | 1.41 | | |
| 1910.56 | 3 | 141.53 | 1.27 | | |
| 1911.72 | 2 | 136.05 | 1.16 | | |
| 1912.54 | 3 | 129.83 | 1.39 | | |
| 1913.57 | 3 | 124.27 | 1.42 | | |
| 1914.51 | 3 | 118.07 | 1.33 | | |
| 1915.56 | 3 | 110.60 | 1.48 | | |
| 1916.48 | 6 | 107.12 | 1.62 | | |
| 1917.39 | 4 | 101.65 | 1.54 | | |
| 1918.50 | 3 | 98.03 | 1.57 | | |
| 1919.55 | 3 | 90.00 | 1.58 | | |
| 1920.46 | 1 | 86.6 | 1.42 | | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece | Remarks |
|-----------------------------------|------------|----------|------------------|----------|-----------------------|
| | <i>h</i> | <i>°</i> | <i>'</i> | | |
| $\Delta 2091^2$, 7748 | | | | | |
| 16 ^h 40.9 ^m | | | +43° 40' | | 6.7 8.3 |
| 1907.571 | 19.1 | 290.3 | 0.48 | VII | Separated. |
| .574 | 19.2 | 292.4 | 0.56 | VII | |
| 1908.571 | 18.7 | 289.6 | 0.47 | VII | |
| .609 | 18.7 | 294.2 | 0.52 | VII | |
| 1911.715 | 21.0 | 271.0 | 0.48 | VII | |
| .721 | 20.5 | 277.5 | 0.49 | VII | |
| 1913.571 | 18.3 | 272.6 | 0.46 | VII | |
| 1914.505 | 15.2 | 264.8 | 0.45 | 7 | |
| .546 | 18.1 | 263.8 | 0.46 | 7 | |
| .566 | 18.2 | 261.0 | 0.42 | 7 | Separated. |
| 1915.603 | 19.4 | 254.2 | 0.49 | 7 | |
| .620 | 18.7 | 252.9 | 0.52 | 7 | Barely separated. |
| 1916.486 | 15.0 | 251.9 | 0.48 | 7 | Good. |
| .579 | 18.7 | 248.6 | 0.48 | 7 | |
| .603 | 19.2 | 254.0 | 0.4 <i>est.</i> | 9 | Separated by glimpses |
| 1917.404 | 13.2 | 247.5 | 0.45 <i>est.</i> | 7 | Difficult. |
| .437 | 13.8 | 251.1 | 0.36 | 7 | Separated. |
| .439 | 14.7 | 246.9 | 0.37 | 7 | Separated by glimpses |
| 1918.699 | 18.6 | 239.8 | 0.39 | 7 | Good. |
| .707 | 18.9 | 240.6 | 0.37 | 7 | |
| 1892.56 | 3 <i>n</i> | 355.77 | 0.40 | | |
| 1895.54 | 3 | 341.07 | .43 | | |
| 1896.50 | 2 | 339.00 | .42 | | |
| 1897.64 | 3 | 332.20 | .54 | | |
| 1898.64 | 3 | 324.97 | .54 | | |
| 1901.46 | 3 | 315.73 | .58 | | |
| 1902.61 | 3 | 311.37 | .59 | | |
| 1903.50 | 3 | 307.03 | .55 | | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece | Remarks |
|------|----------|----------|----------|----------|---------|
| | <i>h</i> | <i>°</i> | <i>"</i> | | |

 $\Delta 2091^2$, 7748—Continued

| | | | | | |
|---------|---|--------|------|--|--|
| 1904.60 | 2 | 300.85 | 0.46 | | |
| 1906.71 | 3 | 295.83 | .47 | | |
| 1907.57 | 2 | 291.35 | .52 | | |
| 1908.59 | 2 | 291.90 | .50 | | |
| 1911.72 | 2 | 274.25 | .48 | | |
| 1914.27 | 4 | 265.55 | .45 | | |
| 1915.61 | 2 | 253.55 | .50 | | |
| 1916.56 | 3 | 251.50 | .45 | | |
| 1917.43 | 3 | 248.50 | .39 | | |
| 1918.70 | 2 | 240.20 | .38 | | |

 Σ 2106, 777816^h 46.0^m

+9° 35'

6.8 ...

| | | | | | |
|----------|------|------------------|------------------|------|----------------------------|
| 1907.574 | 17.6 | 298.9 | 0.25 <i>est.</i> | III | Slight elongation. |
| .579 | 17.0 | 297.1 | 0.25 <i>est.</i> | VII | Wedge. |
| 1908.549 | 17.4 | 280. <i>est.</i> | 0.25 <i>est.</i> | VII | Slight elongation. |
| .617 | 18.5 | 273.6 | 0.30 <i>est.</i> | VIII | Wedge. |
| 1909.584 | 17.5 | ..... | .... |  | Cannot. |
| 1910.603 | 17.4 | 280 <i>est.</i> | 0.25 <i>est.</i> | VII | Suspect. |
| 1912.541 | 16.8 | ..... | .... |  | Suspect elongation in 310° |
| 1913.571 | 17.0 | 278.9 | 0.25 <i>est.</i> | VII | Elongated. |
| .582 | 17.0 | 276.4 | 0.20 <i>est.</i> | | Elongated. |
| 1914.505 | 16.0 | 304.5 | 0.2 <i>est.</i> | 7 | Suspect elongation. |
| .532 | 17.0 | 270. | .... |  | Suspect elongation. |
| .595 | 19.1 | 270.7 | 0.25 <i>est.</i> | 7 | Wedge. |
| 1915.508 | 17.4 | 286.0 | 0.20 <i>est.</i> | 7 | Wedge (?) |
| .710 | 19.1 | 265.7 | 0.25 <i>est.</i> | 7 | Elongated. |
| .713 | 19.3 | 279.7 | 0.25 <i>est.</i> | 7 | Wedge. |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece | Remarks |
|------|----------|----------|----------|----------|---------|
| | <i>h</i> | <i>°</i> | <i>"</i> | | |

 Σ 2106, 7778—Continued

| | | | | | |
|----------|------|--------|------------------|----------------------|----------------------|
| 1916.603 | 19.4 | ..... | Suspect elonga | tion in 270°, 0.25'' | |
| .628 | 18.3 | 271.4 | 0.25 <i>est.</i> | 7 | Elongated ? |
| .645 | 19.4 | 290.8 | 0.25 <i>est.</i> | 7 | Dubious. |
| 1917.617 | 18.4 | 276.6 | 0.20 <i>est.</i> | 7 | Fine seeing. |
| .690 | 19.2 | 268.4 | 0.25 <i>est.</i> | 7 | Wedge. |
| 1918.524 | 15.5 | 288.3 | 0.20 <i>est.</i> | 7 | Doubtful elongation. |
| .682 | 18.4 | 279.2 | 0.25 <i>est.</i> | 7 | Wedge. |
| .699 | 18.4 | 268.4 | 0.25 <i>est.</i> | 7 | Elongated. |
| 1919.535 | 16.0 | 299.2 | 0.20 <i>est.</i> | 7 | Doubtful elongation |
| .637 | 19.3 | 266.5 | 0.25 <i>est.</i> | 7 | Wedge. |
| 1895.59 | 3 n | 311.37 | 0.33 | | |
| 1896.63 | 3 | 303.90 | .34 | | |
| 1897.61 | 3 | 299.93 | .40 | | |
| 1898.57 | 3 | 300.57 | .30 | | |
| 1899.58 | 2 | 298.10 | .30 | | |
| 1901.47 | 2 | 308.00 | .22 | | |
| 1902.80 | 4 | 294.65 | .29 | | |
| 1906.52 | 3 | 301.33 | .27 | | |
| 1907.58 | 2 | 298.00 | .25 | | |
| 1908.58 | 2 | 276.80 | .28 | | |
| 1910.60 | 1 | 280. | .25 | | |
| 1913.58 | 2 | 277.65 | .22 | | |
| 1914.54 | 3 | 281.73 | .22 | | |
| 1915.64 | 3 | 277.13 | .23 | | |
| 1916.63 | 2 | 281.10 | .25 | | |
| 1917.65 | 2 | 272.50 | .22 | | |
| 1918.60 | 3 | 278.63 | .23 | | |
| 1919.59 | 2 | 282.85 | .22 | | |

| Date | Sid. T. | p | s | Eyepiece | Remarks |
|------|---------|-----|-----|----------|---------|
| | h | ° | " | | |

21 Ophiuchi, 7777

16^h 46.3^m

+1° 23'

5.5 7.5

| | | | | | |
|----------|------|-------|------|-----|------------------|
| 1907.571 | 18.1 | 162.7 | 0.85 | VII | |
| .574 | 17.8 | 158.7 | 0.99 | VII | |
| 1908.521 | 16.5 | 158.0 | 0.96 | VII | |
| .549 | 17.6 | 159.8 | 0.71 | VII | |
| .571 | 18.1 | 156.9 | 0.96 | VII | |
| 1909.516 | 17.2 | 157.7 | 0.65 | VII | |
| .584 | 17.7 | 155.7 | 0.77 | VII | |
| 1910.546 | 17.4 | 156.6 | 0.81 | VII | |
| .705 | 18.9 | 157.1 | 0.83 | VII | |
| 1912.521 | 17.1 | 153.6 | 0.78 | VII | Very blurred. |
| .532 | 17.4 | 156.1 | 0.97 | VI | Good. |
| 1913.571 | 17.2 | 156.5 | 0.87 | VII | |
| .582 | 17.1 | 155.0 | 0.71 | VII | |
| 1914.516 | 15.7 | 153.3 | 1.12 | 7 | Blurred. |
| .532 | 17.5 | 155.9 | 0.75 | 9 | Very bad seeing. |
| .546 | 16.1 | 154.3 | 0.83 | 7 | Blurred. |
| 1916.466 | 14.4 | 150.5 | 0.64 | 7 | Blurred |
| .480 | 16.0 | 149.3 | 0.85 | 7 | |
| .503 | 15.1 | 150.7 | 0.66 | 7 | Bad seeing. |
| 1917.437 | 15.2 | 150.4 | 0.77 | 7 | |
| .439 | 15.1 | 149.3 | 0.64 | 7 | |
| .469 | 15.1 | 151.4 | 0.72 | 7 | |
| 1918.466 | 15.9 | 151.9 | 0.64 | 7 | Very bad seeing. |
| .472 | 15.2 | 152.4 | 0.57 | 7 | Very bad seeing. |
| .524 | 15.8 | 157.0 | 0.70 | 7 | Bad seeing. |
| 1919.541 | 17.3 | 155.3 | 0.81 | 7 | |
| .543 | 16.4 | 150.2 | 0.61 | 7 | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece | Remarks |
|------|----------|----------|----------|-----------|---------|
| | <i>h</i> | <i>°</i> | <i>"</i> | | |

21 Ophiuchi, 7777—Continued

| | | | | | |
|----------|------|--------|------|---|---------------|
| 1919.549 | 16.5 | 152.9 | 0.69 | 7 | Very blurred. |
| 1902.62 | 3 n | 158.37 | 0.96 | | |
| 1903.52 | 3 | 155.23 | .76 | | |
| 1904.60 | 2 | 160.25 | .84 | | |
| 1906.53 | 3 | 156.82 | .73 | | |
| 1907.57 | 2 | 160.70 | .92 | | |
| 1908.55 | 3 | 158.23 | .88 | | |
| 1909.55 | 2 | 156.70 | .71 | | |
| 1910.62 | 2 | 156.85 | .82 | | |
| 1912.53 | 2 | 154.85 | .87 | | |
| 1913.58 | 2 | 155.75 | .79 | | |
| 1914.53 | 3 | 154.50 | .90 | | |
| 1916.48 | 3 | 150.17 | .72 | | |
| 1917.45 | 3 | 150.37 | .71 | | |
| 1918.49 | 3 | 153.77 | .64 | | |
| 1919.54 | 3 | 152.80 | .70 | | |

 Σ 2107, 778316^h 47.9^m

+28° 50'

6.5 8.7

| | | | | | |
|----------|------|-------|----------|------|-----------------------|
| 1907.574 | 18.7 | 2.6 | 0.71 | VII | Separated by glimpses |
| .579 | 17.2 | 359.8 | 0.50 | VII | |
| 1908.617 | 18.9 | 1.0 | 0.63 | VIII | |
| .628 | 17.8 | 2.5 | 0.47 | VIII | |
| 1911.721 | 20.7 | 13.3 | 0.72 | VII | |
| 1912.620 | 18.2 | 17.2 | 0.60 | VII | |
| 1913.557 | 18.2 | 20.4 | 0.4 est. | VI | |
| .571 | 18.1 | 28.3 | 0.50 | VI | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eyepeice | Remarks |
|-------------------------------|------------|----------|----------|----------|--------------|
| | <i>h</i> | <i>°</i> | <i>"</i> | | |
| Σ 2107, 7783—Continued | | | | | |
| 1914.491 | 16.0 | 19.6 | 0.52 | 7 | |
| .505 | 15.8 | 19.3 | 0.63 | 7 | |
| .566 | 18.5 | 20.6 | 0.66 | 7 | |
| 1915.508 | 17.6 | 20.5 | 0.67 | 7 | |
| .595 | 18.7 | 27.6 | 0.73 | 7 | |
| 1916.445 | 14.4 | 22.0 | 0.61 | 7 | |
| .486 | 14.5 | 25.1 | 0.76 | 7 | |
| .524 | 16.1 | 29.7 | 0.76 | 7 | |
| .688 | 19.8 | 25.1 | 0.59 | 7 | Difficult. |
| 1917.401 | 14.2 | 32.9 | 0.58 | 7 | |
| .404 | 13.7 | 26.9 | 0.70 | 9 | |
| .437 | 14.1 | 27.4 | 0.54 | 7 | |
| 1918.472 | 16.0 | 33.0 | 0.55 | 7 | Bad seeing. |
| .568 | 17.8 | 30.4 | 0.64 | 7 | |
| .648 | 18.9 | 33.2 | 0.54 | 7 | Bad seeing. |
| 1919.535 | 16.3 | 31.8 | 0.68 | 7 | Good. |
| .582 | 16.4 | 31.5 | 0.68 | 7 | Poor seeing. |
| .631 | 18.7 | 32.1 | 0.64 | 7 | |
| 1892.60 | 4 <i>n</i> | 280.22 | 0.44 | | |
| 1895.59 | 3 | 290.93 | .34 | | |
| 1896.63 | 3 | 297.57 | .37 | | |
| 1897.64 | 3 | 306.00 | .43 | | |
| 1898.58 | 2 | 310.55 | .41 | | |
| 1901.47 | 4 | 329.38 | .31 | | |
| 1902.63 | 3 | 339.07 | .42 | | |
| 1903.50 | 2 | 339.80 | .36 | | |
| 1906.53 | 2 | 353.30 | .54 | | |
| 1907.58 | 2 | 1.20 | .60 | | |
| 1908.62 | 2 | 1.75 | .55 | | |

| Date | Sid. T. | p | s | Eye-piece | Remarks |
|------|---------|-----|-----|-----------|---------|
| | h | ° | ' | | |

 Σ 2107, 7783—Continued

| | | | | | |
|---------|---|-------|-----|--|--|
| 1912.17 | 2 | 15.25 | .66 | | |
| 1913.56 | 2 | 24.35 | .45 | | |
| 1914.52 | 3 | 19.83 | .60 | | |
| 1915.55 | 2 | 24.05 | .70 | | |
| 1916.54 | 4 | 25.48 | .68 | | |
| 1917.41 | 3 | 32.40 | .61 | | |
| 1918.56 | 3 | 32.20 | .58 | | |
| 1919.58 | 3 | 31.80 | .67 | | |

 β 821, 778516^h 48.1^m

+32° 1'

8.7 10.2

| | | | | | |
|----------|------|-------|------|-----|------------|
| 1907.571 | 19.5 | 313.4 | 1.41 | VI | |
| .574 | 19.6 | 313.1 | 1.37 | VII | |
| 1908.617 | 18.7 | 313.3 | 1.38 | VI | |
| .628 | 18.1 | 311.8 | 1.31 | VI | |
| 1909.560 | 19.1 | 314.0 | 1.23 | VI | |
| .658 | 18.8 | 312.6 | 1.12 | V | |
| 1910.546 | 17.9 | 312.6 | 1.23 | VI | |
| .576 | 18.2 | 311.7 | 1.16 | VI | |
| 1911.715 | 21.2 | 314.0 | 1.08 | VI | |
| .721 | 20.8 | 313.6 | 1.11 | VII | |
| 1913.557 | 18.4 | 313.5 | 1.09 | VI | |
| .571 | 18.7 | 313.2 | 0.99 | VI | Difficult. |
| 1914.474 | 15.6 | 315.4 | 1.07 | 9 | |
| .491 | 15.7 | 315.5 | 1.26 | 7 | |
| .519 | 15.8 | 313.7 | 1.08 | 12 | |
| 1915.595 | 18.4 | 314.2 | 1.14 | 7 | |
| .603 | 19.6 | 310.3 | 1.11 | 9 | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece | Remarks |
|-----------------------|------------|----------|----------|----------|------------|
| | <i>h</i> | <i>°</i> | <i>"</i> | | |
| β 821, 7785—Continued | | | | | |
| 1916.445 | 14.7 | 317.4 | 1.09 | V | |
| .466 | 16.0 | 317.3 | 1.18 | 12 | |
| .480 | 15.1 | 315.1 | 1.32 | 9 | Difficult. |
| .688 | 19.5 | 318.0 | 1.17 | 9 | |
| 1917.396 | 13.8 | 314.1 | 0.96 | V | |
| .404 | 13.9 | 316.0 | 0.90 | V | |
| .437 | 14.6 | 315.0 | 1.30 | 12 | Difficult. |
| 1918.568 | 18.1 | 312.5 | 0.93 | 9 | Difficult. |
| .595 | 18.0 | 315.5 | 1.12 | V | |
| 1919.535 | 16.5 | 320.5 | 1.39 | V | |
| .628 | 18.1 | 311.1 | 1.03 | 9 | Difficult. |
| 1888.49 | 3 <i>n</i> | 313.63 | 1.30 | | |
| 1902.64 | 3 | 312.87 | 1.27 | | |
| 1907.57 | 2 | 313.25 | 1.39 | | |
| 1908.62 | 2 | 312.55 | 1.34 | | |
| 1909.61 | 2 | 313.30 | 1.18 | | |
| 1910.56 | 2 | 312.15 | 1.20 | | |
| 1911.72 | 2 | 313.50 | 1.10 | | |
| 1913.56 | 2 | 313.35 | 1.04 | | |
| 1914.49 | 3 | 314.87 | 1.14 | | |
| 1915.60 | 2 | 312.25 | 1.12 | | |
| 1916.52 | 4 | 315.95 | 1.19 | | |
| 1917.41 | 3 | 315.03 | 1.05 | | |
| 1918.58 | 2 | 314.00 | 1.02 | | |
| 1919.58 | 2 | 315.85 | 1.21 | | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece | Remarks |
|------|----------|----------|----------|----------|---------|
| | <i>h</i> | <i>°</i> | <i>"</i> | | |

 Σ 2118, 20 Draconis, 783416^h 55.9^m

+65° 12'

6.4 6.6

| | | | | | |
|----------|------------|-------|------------------|------|-------------------|
| 1907.571 | 19.7 | 88.1 | 0.30 <i>est.</i> | VII | Notched. |
| .574 | 19.0 | 90.0 | 0.30 <i>est.</i> | VII | Notched. |
| 1908.571 | 17.4 | 80.9 | 0.40 | VII | Barely separated. |
| .609 | 19.0 | 92.4 | 0.49 | VII | Notched. |
| .617 | 19.3 | 83.8 | 0.39 | VIII | Not separated. |
| 1911.715 | 21.4 | .... | .... |  | Cannot. |
| 1914.505 | 15.4 | .... | .... |  | Cannot. |
| 1916.486 | 15.2 | 82.5 | 0.53 | 7 | Well separated. |
| .579 | 18.9 | 79.1 | 0.48 | 7 | |
| .603 | 18.6 | 83.1 | 0.60 | 9 | Separated. |
| 1917.437 | 14.8 | 78.9 | 0.52 | | |
| .549 | 16.4 | 78.6 | 0.51 | | |
| 1901.46 | 3 <i>n</i> | 87.33 | 0.23 | | |
| 1907.57 | 2 | 89.05 | .30 | | |
| 1908.60 | 3 | 85.70 | .43 | | |
| 1913. | 2 | ? | ? | | |
| 1916.56 | 3 | 81.57 | .54 | | Proper motion? |
| 1917.49 | 2 | 78.75 | .52 | | |

 β 823, 786317^h 1.5^m

+0° 47'

8.3 10.0

| | | | | | |
|----------|------|------|------|----|------------|
| 1912.565 | 17.0 | 20.9 | 0.98 | VI | |
| .614 | 18.4 | 24.0 | 0.87 | VI | Blurred. |
| 1913.571 | 17.4 | 24.1 | 0.95 | VI | Difficult. |
| .582 | 17.4 | 25.2 | 0.90 | VI | |
| 1914.497 | 18.0 | 23.5 | 1.08 | 9 | |
| .505 | 16.2 | 24.3 | 0.88 | 12 | |
| .546 | 16.2 | 22.7 | 1.02 | 9 | |

| Date | Sid. T. | p | s | Eyepiece | Remarks |
|-----------------------------|---------|--------|------|----------|--------------------|
| | h | ° | " | | |
| β 823, 7863—Continued | | | | | |
| 1915.538 | 18.3 | 26.1 | 0.78 | 9 | Poor. |
| .603 | 17.6 | 24.7 | 1.01 | 7 | |
| 1916.480 | 14.7 | 25.0 | 0.96 | 9 | Difficult. |
| .486 | 15.8 | 21.8 | 1.05 | 9 | Difficult. |
| .524 | 16.3 | 24.2 | 0.96 | 9 | Bad seeing. |
| 1917.437 | 15.5 | 26.4 | 0.95 | 12 | |
| .439 | 15.4 | 27.4 | 1.00 | 12 | |
| .469 | 15.8 | 27.6 | 1.04 | 12 | |
| 1918.472 | 16.3 | 25.4 | 0.69 | 9 | Clouds. Difficult. |
| .568 | 18.4 | 31.0 | 0.99 | 9 | Difficult. |
| .595 | 17.8 | 29.8 | 0.78 | 9 | |
| 1919.535 | 16.7 | 27.0 | 0.86 | 7 | |
| .628 | 17.9 | 29.2 | 0.83 | 9 | Difficult. |
| .637 | 18.1 | 29.2 | 0.86 | 7 | |
| 1888.41 | 3 n | 357.13 | 1.19 | | |
| 1902.63 | 3 | 11.67 | 1.07 | | |
| 1903.56 | 3 | 12.90 | 0.96 | | |
| 1904.59 | 2 | 15.30 | 1.02 | | |
| 1906.52 | 3 | 15.23 | 0.92 | | |
| 1912.59 | 2 | 22.45 | 0.92 | | |
| 1913.58 | 2 | 24.65 | 0.92 | | |
| 1914.52 | 3 | 23.50 | 0.99 | | |
| 1915.57 | 2 | 25.40 | 0.94 | | |
| 1916.50 | 3 | 23.67 | 0.99 | | |
| 1917.44 | 3 | 27.13 | 1.00 | | |
| 1918.51 | 3 | 28.73 | 0.82 | | |
| 1919.60 | 3 | 28.47 | 0.85 | | |

| Date | Sid. T. | p | s | Eye-piece | Remarks |
|---|---------|--------|------|-----------|-------------|
| h | ° | " | | | |
| Σ 2130, μ Draconis, 7878 17 ^h 3.4 ^m +54° 37' 5.8 5.8 | | | | | |
| 1907.645 | 18.6 | 137.3 | 2.46 | V | Good. |
| .648 | 18.6 | 141.5 | 2.47 | VII | |
| 1908.617 | 19.2 | 136.2 | 2.39 | VI | |
| .628 | 19.2 | 136.0 | 2.44 | III | |
| 1909.530 | 15.9 | 136.9 | 2.25 | VI | |
| 1910.576 | 18.4 | 317.7 | 2.39 | VI | |
| .718 | 19.5 | 137.0 | 2.41 | VI | |
| 1911.715 | 21.5 | 134.0 | 2.37 | VII | |
| 1912.614 | 18.7 | 134.2 | 2.39 | VI | |
| .688 | 18.5 | 134.2 | 2.22 | VI | |
| 1913.590 | 17.9 | 133.6 | 2.49 | VII | |
| .688 | 19.0 | 130.8 | 2.07 | V | |
| 1915.486 | 14.9 | 128.7 | 2.31 | 9 | |
| .609 | 18.8 | 130.2 | 2.39 | 7 | |
| 1916.503 | 15.4 | 127.9 | 2.35 | 12 | |
| .521 | 15.9 | 127.7 | 2.22 | 7 | Good. |
| .612 | 18.6 | 129.9 | 2.48 | 7 | |
| 1917.396 | 14.1 | 307.6 | 2.44 | 9 | |
| .434 | 13.1 | 128.8 | 2.26 | 12 | Good. |
| .442 | 13.7 | 125.2 | 2.43 | 12 | |
| 1918.734 | 18.8 | 127.3 | 2.23 | 7 | Good. |
| .754 | 19.9 | 127.6 | 2.25 | 7 | |
| 1919.552 | 16.0 | 124.8 | 2.24 | 7 | Bad seeing. |
| .574 | 16.3 | 126.0 | 2.48 | 12 | |
| .723 | 19.3 | 124.6 | 2.30 | 9 | |
| 1892.72 | 3 n | 155.47 | 2.40 | | |
| 1893.84 | 2 | 153.25 | 2.40 | | |
| 1895.66 | 3 | 153.03 | 2.41 | | |

Ob 8

| Date | Sid. T. | p | s | Eyepiece. | Remarks |
|------|---------|-----|-----|-----------|---------|
| | h | ° | ' | | |

 Σ 2130, μ Draconis, 7878—Continued

| | | | | | |
|---------|---|--------|------|--|--|
| 1896.42 | 3 | 152.23 | 2.35 | | |
| 1902.67 | 3 | 144.87 | 2.51 | | |
| 1903.44 | 3 | 144.13 | 2.47 | | |
| 1904.70 | 2 | 143.55 | 2.34 | | |
| 1905.72 | 2 | 140.35 | 2.57 | | |
| 1906.55 | 3 | 140.77 | 2.36 | | |
| 1907.65 | 2 | 139.40 | 2.46 | | |
| 1908.92 | 3 | 136.87 | 2.36 | | |
| 1911.00 | 3 | 136.23 | 2.39 | | |
| 1912.65 | 2 | 134.20 | 2.30 | | |
| 1913.64 | 2 | 132.20 | 2.28 | | |
| 1915.55 | 2 | 129.45 | 2.35 | | |
| 1916.54 | 3 | 128.50 | 2.35 | | |
| 1917.42 | 3 | 127.20 | 2.38 | | |
| 1918.74 | 2 | 127.45 | 2.24 | | |
| 1919.62 | 3 | 125.13 | 2.34 | | |

 η Ophiuchi, 788517^h 4.7^m

—15° 35'

2.6 4.0

| | | | | | |
|----------|------|-------|------|------|---------------|
| 1907.579 | 17.9 | 247.5 | 0.54 | VII | |
| .608 | 17.8 | 248.2 | 0.50 | VII | |
| 1908.571 | 17.8 | 242.5 | 0.63 | VII | |
| .582 | 17.6 | 242.5 | 0.49 | VII | |
| 1910.521 | 17.1 | 241.9 | 0.45 | VII | Very blurred. |
| 1912.524 | 16.5 | 240.3 | 0.52 | VIII | Very blurred. |
| .532 | 17.7 | 237.3 | 0.56 | VIII | |
| 1913.571 | 17.7 | 240.9 | 0.69 | VI | Blurred. |
| .584 | 17.8 | 240.2 | 0.67 | VII | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece | Remarks |
|------|----------|----------|----------|----------|---------|
| | <i>h</i> | <i>°</i> | <i>"</i> | | |

 η Ophiuchi, 7885—Continued

| | | | | | |
|----------|------------|--------|------|----|-------------|
| 1914.505 | 17.1 | 234.2 | 0.66 | 7 | Blasing. |
| .519 | 17.5 | 239.0 | 0.65 | 7 | Blasing. |
| .595 | 18.4 | 241.4 | 0.69 | 12 | |
| 1915.601 | 17.2 | 240.4 | 0.62 | 7 | |
| .603 | 17.3 | 238.7 | 0.63 | 7 | |
| 1916.543 | 15.9 | 235.9 | 0.56 | 7 | Blurred. |
| .546 | 16.2 | 237.4 | 0.58 | 7 | |
| .571 | 16.2 | 236.0 | 0.44 | 7 | |
| 1917.491 | 16.1 | 239.1 | 0.56 | 7 | Bad seeing. |
| .513 | 16.8 | 234.3 | 0.51 | 7 | |
| .516 | 16.6 | 241.2 | 0.62 | 7 | |
| 1918.595 | 17.6 | 234.0 | 0.52 | 7 | |
| .682 | 17.7 | 240.5 | 0.46 | 7 | Blasing. |
| .699 | 18.1 | 236.8 | 0.56 | 7 | |
| .707 | 18.5 | 238.6 | 0.47 | 7 | Blurred. |
| 1919.637 | 17.9 | 233.5 | 0.58 | 7 | |
| .648 | 17.9 | 234.7 | 0.58 | 7 | |
| 1902.57 | 2 <i>n</i> | 251.35 | 0.46 | | |
| 1903.62 | 2 | 249.00 | .52 | | |
| 1904.57 | 2 | 244.30 | .46 | | |
| 1906.58 | 3 | 245.70 | .48 | | |
| 1907.59 | 2 | 247.85 | .52 | | |
| 1908.58 | 2 | 242.50 | .56 | | |
| 1910.52 | 1 | 241.9 | .45 | | |
| 1912.53 | 2 | 238.80 | .54 | | |
| 1913.58 | 2 | 240.55 | .68 | | |
| 1914.54 | 3 | 238.20 | .67 | | |
| 1915.60 | 2 | 239.55 | .62 | | |

OBSERVATIONS OF DOUBLE STARS

| Date | Sid. T. | p | s | Eye-piece | Remarks |
|------|---------|-----|-----|-----------|---------|
| | h | ° | ' | | |

 η Ophiuchi, 7885—Continued

| | | | | | |
|---------|---|--------|------|--|--|
| 1916.55 | 3 | 236.43 | 0.53 | | |
| 1917.51 | 3 | 238.20 | .56 | | |
| 1918.67 | 4 | 237.48 | .50 | | |
| 1919.64 | 2 | 234.10 | .58 | | |

 β 416, 792917^h 12.1^m

—34° 53'

6.3 7.8

| | | | | | |
|----------|------------|--------|------|-----|----------------|
| 1907.617 | 17.3 | 270.5 | 1.91 | V | Badly blurred. |
| .626 | 18.1 | 270.6 | 1.64 | X | |
| 1908.582 | 17.3 | 268.0 | 1.90 | V | |
| 1913.584 | 17.6 | 251.6 | 1.77 | VII | |
| 1914.491 | 17.1 | 249.1 | 2.00 | 12 | |
| .497 | 17.7 | 242.0 | 1.45 | 12 | |
| .595 | 18.6 | 247.8 | 1.62 | V | |
| 1915.601 | 17.4 | 238.7 | 1.59 | 12 | |
| 1917.513 | 17.0 | 233.1 | 1.50 | V | |
| .589 | 17.6 | 234.1 | 1.40 | 12 | |
| 1896.09 | 2 <i>n</i> | 317.25 | 1.14 | | |
| 1897.63 | 2 | 305.40 | 1.61 | | |
| 1898.60 | 2 | 305.55 | 1.51 | | |
| 1899.58 | 3 | 297.47 | 1.77 | | |
| 1902.57 | 2 | 288.55 | 1.72 | | |
| 1903.91 | 3 | 283.13 | 1.84 | | |
| 1906.54 | 2 | 272.90 | 2.08 | | |
| 1907.94 | 3 | 269.70 | 1.82 | | |
| 1913.58 | 1 | 251.6 | 1.77 | | |
| 1914.53 | 3 | 246.30 | 1.69 | | |
| 1915.60 | 1 | 238.7 | 1.59 | | |
| 1917.55 | 2 | 233.60 | 1.55 | | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece | Remarks |
|------|---------|----------|----------|----------|---------|
| | h | ° | " | | |

41 Ophiuchi

17^h 11.5^m

-0° 20'

4.8 8.6

| | | | | | |
|----------|------|--------|------|---|-----------------|
| 1916.628 | 18.6 | 301.6 | 0.66 | 7 | |
| .702 | 19.5 | 292.2 | 0.51 | 7 | Very blurred. |
| 1917.513 | 17.2 | 299.5 | 0.49 | 7 | Difficult. |
| .565 | 17.5 | 306.6 | 0.55 | 7 | Difficult. |
| .617 | 18.6 | 296.2 | 0.54 | 7 | Well separated. |
| 1918.682 | 17.8 | 302.0 | 0.50 | 7 | |
| .699 | 18.3 | 297.0 | 0.54 | 7 | |
| .707 | 18.6 | 302.1 | 0.54 | 7 | Difficult. |
| 1919.637 | 17.8 | 297.9 | 0.51 | 7 | |
| 1916.63 | 2 n | 296.90 | 0.58 | | |
| 1917.56 | 3 | 300.77 | .53 | | |
| 1918.70 | 3 | 300.87 | .53 | | |
| 1919.64 | 1 | 297.9 | .51 | | |

Σ 2173, 8038

17^h 25.2^m

-0° 58'

6.3 6.4

| | | | | | |
|----------|------|-------|------------------|-----------------------------|-----------------------|
| 1907.579 | 18.1 | 316.9 | 0.49 | VII | |
| .608 | 18.1 | 326.7 | 0.54 | VII | Very blurred. |
| 1908.571 | 17.7 | 312.1 | 0.25 <i>est.</i> | VII | Elongated. Difficult. |
| .628 | 18.3 | 301.3 | 0.30 <i>est.</i> | VI | Elongated. |
| 1910.705 | 19.0 | ..... | .... | Suspect elongation in 15°. | |
| 1912.524 | 16.7 | ..... | .... | Suspect elongation in 175°. | |
| .541 | 17.2 | 172.7 | 0.35 <i>est.</i> | VIII | Elongated. |
| .565 | 17.3 | 184.5 | 0.35 <i>est.</i> | VIII | Elongated. |
| 1913.571 | 17.9 | 166.2 | 0.59 | VI | Notched. |
| .582 | 17.6 | 169.1 | 0.56 | VII | |
| 1914.505 | 17.2 | 164.5 | 0.58 | 7 | |
| .519 | 17.7 | 164.2 | 0.63 | 7 | |
| .582 | 18.5 | 164.2 | 0.64 | 7 | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece | Remarks |
|------|----------|----------|----------|-----------|---------|
| | <i>h</i> | <i>°</i> | <i>'</i> | | |

 Σ 2173, 8038—Continued

| | | | | | |
|----------|------------|--------|------|---|---------------|
| 1915.508 | 17.9 | 162.6 | 0.70 | 7 | Bad seeing. |
| .595 | 19.4 | 161.0 | 0.78 | 7 | |
| .710 | 19.3 | 163.4 | 0.55 | 7 | |
| 1916.513 | 17.2 | 160.8 | 0.64 | 7 | |
| .521 | 17.2 | 158.0 | 0.73 | 7 | Very blurred. |
| .546 | 16.4 | 157.2 | 0.61 | 7 | |
| 1917.469 | 16.4 | 154.7 | 0.78 | 7 | |
| .491 | 15.9 | 155.4 | 0.64 | 7 | |
| .513 | 17.4 | 336.8 | 0.63 | 7 | |
| 1918.576 | 18.4 | 155.7 | 0.74 | 7 | |
| .579 | 17.5 | 157.6 | 0.73 | 7 | |
| .595 | 17.4 | 154.1 | 0.60 | 7 | |
| 1919.535 | 17.0 | 151.4 | 0.70 | 7 | |
| .584 | 17.1 | 153.3 | 0.73 | 7 | |
| .637 | 17.6 | 152.2 | 0.71 | 7 | |
| 1892.54 | 4 <i>n</i> | 341.82 | 0.90 | | |
| 1895.57 | 3 | 337.67 | 1.13 | | |
| 1896.59 | 3 | 335.63 | 0.99 | | |
| 1897.60 | 3 | 334.60 | 1.14 | | |
| 1898.60 | 2 | 333.60 | 1.02 | | |
| 1899.57 | 4 | 333.53 | 1.08 | | |
| 1901.47 | 4 | 332.22 | 0.83 | | |
| 1902.60 | 3 | 331.53 | 0.94 | | |
| 1903.56 | 3 | 328.70 | 0.93 | | |
| 1904.70 | 2 | 326.80 | 0.78 | | |
| 1906.54 | 3 | 321.53 | 0.72 | | |
| 1907.59 | 2 | 321.80 | 0.52 | | |
| 1908.60 | 2 | 306.70 | 0.28 | | |
| 1910. | 1 | ? | ? | | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece | Remarks |
|------|---------|----------|----------|----------|---------|
| | h | ° | " | | |

Σ 2173, 8038—Continued

| | | | | | |
|---------|---|--------|------|--|--|
| 1912.55 | 2 | 178.60 | 0.35 | | |
| 1913.58 | 2 | 167.65 | 0.58 | | |
| 1914.54 | 3 | 164.30 | 0.62 | | |
| 1915.60 | 3 | 162.33 | 0.68 | | |
| 1916.53 | 3 | 158.67 | 0.66 | | |
| 1917.49 | 3 | 155.63 | 0.68 | | |
| 1918.58 | 3 | 155.80 | 0.69 | | |
| 1919.58 | 3 | 152.30 | 0.71 | | |

26 Draconis, 8099

17^h 33.9^m

+61° 58'

5.3 10.3

| | | | | | |
|----------|------|-------|------|-----|-------------------------|
| 1908.617 | 19.7 | ..... | .... |  | Suspect comes in 0°, 1° |
| 1910.718 | 19.7 | 164.8 | 1.30 | VII | |
| 1911.715 | 21.8 | 346.0 | 1.44 | VI | |
| .721 | 21.2 | 341.8 | 1.53 | VII | |
| 1912.532 | 16.1 | 345.9 | 1.57 | VI | |
| .541 | 16.6 | 345.3 | 1.47 | VII | Good. |
| 1914.505 | 15.5 | 338.7 | 1.80 | 12 | |
| .513 | 16.6 | 342.2 | 1.75 | 12 | Poor seeing. |
| 1915.486 | 14.7 | 340.2 | 1.71 | 9 | |
| .609 | 19.0 | 338.5 | 1.57 | 9 | |
| 1916.480 | 16.4 | 345.7 | 1.76 | 9 | |
| .486 | 15.6 | 335.0 | 1.80 | 9 | |
| .521 | 16.1 | 340.4 | 1.88 | 7 | |
| 1917.685 | 18.7 | 337.7 | 1.67 | 12 | |
| .712 | 21.0 | 333.4 | 1.97 | 12 | Very bad. |
| 1918.472 | 15.6 | 337.2 | 1.60 | 7 | Good. |
| .521 | 16.3 | 336.7 | 1.87 | 7 | |
| .699 | 18.9 | 337.5 | 1.69 | 9 | Good. |

| Date | Sid. T. | p | s | Eye-piece | Remarks |
|------|---------|-----|-----|-----------|---------|
| | h | ° | ' | | |

26 Draconis, 8099—Continued

| | | | | | |
|----------|------|--------|------|---|------------------|
| 1919.552 | 16.2 | 336.8 | 1.82 | 7 | Very blurred. |
| .723 | 19.1 | 336.8 | 1.82 | 9 | Bad seeing. |
| .732 | 20.8 | 333.1 | 1.90 | 9 | Very bad seeing. |
| 1908. | 1 n | ? | ? | | |
| 1911.38 | 3 | 344.20 | 1.42 | | |
| 1912.54 | 2 | 345.60 | 1.52 | | |
| 1914.51 | 2 | 340.45 | 1.67 | | |
| 1915.55 | 2 | 339.35 | 1.68 | | |
| 1916.50 | 3 | 340.37 | 1.81 | | |
| 1917.70 | 2 | 335.55 | 1.82 | | |
| 1918.57 | 3 | 337.13 | 1.72 | | |
| 1919.67 | 3 | 335.57 | 1.85 | | |

 μ^2 Herculis, 816217^h 42.6^m

+27° 47'

10.1 11.0

| | | | | | |
|----------|------|-------|------------------|-----|---------------------|
| 1907.571 | 18.6 | 78.3 | 1.23 | VI | |
| .614 | 18.3 | 75.2 | 1.18 | VI | Good. |
| 1908.549 | 16.4 | 259.3 | 1.09 | III | |
| .617 | 19.9 | 76.4 | 1.16 | III | |
| 1909.715 | 20.7 | 87.8 | 1.11 | V | Difficult |
| 1910.705 | 19.9 | 94.3 | 0.92 | VII | Good. |
| .718 | 19.9 | 96.3 | 0.82 | VII | Difficult. |
| 1911.721 | 21.0 | 104.4 | 0.66 | VII | |
| .778 | 19.2 | 104.6 | 0.61 | VII | Daylight. |
| 1913.584 | 18.4 | 129.8 | 0.39 | VII | Difficult. |
| .679 | 19.5 | 129.9 | 0.37 | VII | |
| 1914.505 | 16.5 | 154.2 | 0.38 | 7 | Difficult. |
| .543 | 15.7 | 146. | 0.25 <i>est.</i> | 7 | Suspect elongation. |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece | Remarks |
|------|---------|----------|----------|----------|---------|
| h | ° | " | | | |

 μ^2 Hercules, 8162—Continued

| | | | | | |
|----------|------------|-------|------------------|---|---------------------------|
| 1914.595 | 18.9 | 152.0 | 0.58 | 7 | Faint and difficult. |
| 1915.595 | 19.6 | 169.6 | 0.45 | 7 | |
| .606 | 20.0 | 177.8 | 0.38 | 9 | Very faint and difficult. |
| .713 | 19.7 | 177.1 | 0.38 | 9 | Difficult. |
| 1916.579 | 19.2 | 198.0 | 0.5 <i>est.</i> | 9 | Faint and very difficult. |
| .603 | 19.5 | 198.3 | .... | 9 | Very doubtful. |
| .658 | 18.4 | 193.7 | 0.5 <i>est.</i> | 7 | Cannot measure dist. |
| .729 | 19.9 | 193.6 | 0.65 | 7 | Good. |
| 1917.491 | 15.0 | 199.1 | 0.64 | 9 | |
| .617 | 18.8 | 207.2 | 0.52 | 7 | Difficult but well sep. |
| .690 | 19.1 | 209.3 | 0.66 | 7 | Good. |
| 1918.576 | 18.2 | 215.8 | 0.71 | 7 | Faint. Difficult. |
| .579 | 17.7 | 210.3 | 0.49 | 7 | |
| .682 | 18.6 | 218.8 | 0.40 <i>est.</i> | 7 | Faint. Difficult. |
| 1919.584 | 17.3 | 222.9 | 0.79 | 7 | Difficult. |
| .637 | 19.5 | 220.8 | 0.82 | 7 | Faint and difficult. |
| 1892.55 | 4 <i>n</i> | 29.12 | 0.83 | | |
| 1894.77 | 3 | 41.60 | 1.16 | | |
| 1895.60 | 3 | 44.37 | 1.16 | | |
| 1896.65 | 2 | 48.55 | 1.37 | | |
| 1897.66 | 3 | 51.30 | 1.43 | | |
| 1898.63 | 3 | 51.80 | 1.41 | | |
| 1899.58 | 2 | 54.20 | 1.65 | | |
| 1901.45 | 3 | 59.30 | 1.44 | | |
| 1902.65 | 3 | 61.50 | 1.58 | | |
| 1903.60 | 3 | 64.47 | 1.47 | | |
| 1904.70 | 2 | 66.15 | 1.40 | | |
| 1906.54 | 4 | 73.60 | 1.35 | | |
| 1907.59 | 2 | 76.75 | 1.20 | | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece | Remarks |
|------|----------|----------|----------|-----------|---------|
| | <i>h</i> | <i>°</i> | <i>"</i> | | |

 μ^3 Hercules, 8162—Continued

| | | | | | |
|---------|---|--------|------|--|--|
| 1908.58 | 2 | 77.85 | 1.12 | | |
| 1910.38 | 3 | 92.80 | 0.95 | | |
| 1911.75 | 2 | 104.50 | .64 | | |
| 1913.63 | 2 | 129.85 | .38 | | |
| 1914.55 | 3 | 150.73 | .40 | | |
| 1915.64 | 3 | 174.83 | .40 | | |
| 1916.64 | 4 | 195.90 | .55 | | |
| 1917.60 | 3 | 205.20 | .61 | | |
| 1918.61 | 3 | 214.97 | .53 | | |
| 1919.61 | 2 | 221.85 | .80 | | |

O Σ 338, 821017^h 47.5^m

+15° 22'

6.9 7.1

| | | | | | |
|----------|------|-------|------|------|----------|
| 1907.587 | 19.7 | 15.4 | 0.70 | VII | |
| .614 | 19.1 | 11.2 | 0.77 | VI | |
| 1908.582 | 17.8 | 12.6 | 0.67 | VII | |
| .628 | 18.6 | 13.8 | 0.71 | VI | |
| 1909.584 | 17.9 | 11.1 | 0.74 | VII | |
| .658 | 18.3 | 12.4 | 0.59 | VI | |
| 1910.590 | 17.6 | 10.4 | 0.64 | VII | Blurred. |
| .705 | 19.7 | 12.5 | 0.78 | VII | |
| 1912.524 | 16.8 | 12.0 | 0.56 | VIII | |
| .541 | 17.3 | 12.3 | 0.66 | VII | |
| 1913.582 | 18.2 | 11.9 | 0.74 | VI | |
| .584 | 18.2 | 12.6 | 0.76 | VII | Good. |
| 1914.505 | 16.7 | 191.2 | 0.73 | 7 | |
| .508 | 16.8 | 190.2 | 0.74 | 7 | |
| .591 | 17.1 | 188.2 | 0.79 | 7 | |
| 1915.595 | 19.8 | 192.5 | 0.84 | 7 | |

| Date | Sid. T. | p | s | Eyepiece | Remarks |
|------|---------|------------|-----|----------|---------|
| | h | $^{\circ}$ | $'$ | | |

O Σ 338, 8210—Continued

| | | | | | |
|----------|-------|-------|------|---|--|
| 1915.603 | 17.8 | 190.6 | 0.67 | 7 | Good. Very bad seeing. Bad seeing. |
| .713 | 19.5 | 193.5 | 0.60 | 7 | |
| 1916.466 | 16.6 | 188.8 | 0.78 | 7 | |
| .480 | 17.0 | 187.3 | 0.75 | 7 | |
| .521 | 16.9 | 187.0 | 0.88 | 7 | |
| 1917.437 | 15.7 | 190.9 | 0.74 | 7 | |
| .491 | 15.3 | 190.5 | 0.77 | 7 | |
| .516 | 15.8 | 6.2 | 0.66 | 7 | |
| 1918.521 | 17.1 | 187.5 | 0.63 | 7 | |
| .579 | 17.9 | 189.1 | 0.65 | 7 | |
| .682 | 18.0 | 189.6 | 0.70 | 7 | |
| 1919.543 | 16.7 | 188.9 | 0.61 | 7 | |
| .574 | 16.5 | 188.9 | 0.61 | 7 | |
| .584 | 17.5 | 190.7 | 0.63 | 7 | |
| 1894.51 | 4 n | 19.67 | 0.61 | | |
| 1895.60 | 3 | 14.87 | .60 | | |
| 1896.62 | 2 | 16.25 | .58 | | |
| 1902.60 | 3 | 15.43 | .68 | | |
| 1903.60 | 3 | 13.47 | .73 | | |
| 1904.79 | 1 | 16.5 | .76 | | |
| 1906.54 | 3 | 11.57 | .78 | | |
| 1907.60 | 2 | 13.30 | .73 | | |
| 1908.60 | 2 | 13.20 | .69 | | |
| 1909.61 | 2 | 11.75 | .66 | | |
| 1910.65 | 2 | 11.45 | .71 | | |
| 1912.53 | 2 | 12.15 | .61 | | |
| 1913.58 | 2 | 12.25 | .75 | | |
| 1914.53 | 3 | 9.83 | .75 | | |
| 1915.64 | 3 | 12.20 | .70 | | |

| Date | Sid. T. | p | s | Eyepiece | Remarks |
|------|---------|-----|-----|----------|---------|
| | h | ° | ' | | |

O Σ 338, 8210—Continued

| | | | | | |
|---------|---|------|------|--|--|
| 1916.49 | 3 | 7.70 | 0.80 | | |
| 1917.48 | 3 | 9.20 | .72 | | |
| 1918.59 | 3 | 8.73 | .66 | | |
| 1919.57 | 3 | 9.50 | .62 | | |

 τ Ophiuchi, 830317^h 57.6^m

—8° 11'

6.0 7.4

| | | | | | |
|----------|------|--------|------|-----|-------------|
| 1913.582 | 17.9 | 259.0 | 2.18 | V | Bad seeing. |
| .584 | 18.0 | 261.5 | 1.96 | VII | |
| 1914.505 | 17.5 | 258.8 | 1.95 | 7 | |
| .519 | 17.9 | 259.1 | 2.22 | 12 | |
| .582 | 18.7 | 257.7 | 1.93 | 7 | |
| 1915.603 | 18.1 | 258.1 | 2.00 | 7 | |
| .609 | 17.9 | 258.7 | 2.10 | 7 | |
| .620 | 19.5 | 261.1 | 1.98 | 7 | |
| 1916.486 | 16.7 | 259.4 | 2.32 | 12 | |
| .516 | 17.0 | 258.5 | 2.15 | 12 | |
| .521 | 17.4 | 258.5 | 2.10 | 7 | |
| .658 | 18.1 | 257.5 | 1.87 | 7 | |
| 1917.469 | 16.8 | 259.1 | 2.21 | 12 | |
| .491 | 16.4 | 259.9 | 1.93 | 7 | |
| .513 | 17.5 | 257.2 | 1.90 | 7 | |
| 1918.595 | 18.9 | 260.0 | 2.02 | 7 | |
| .628 | 17.9 | 260.3 | 1.90 | 12 | |
| .648 | 18.3 | 261.6 | 2.00 | 7 | |
| 1919.543 | 17.0 | 258.4 | 2.03 | 12 | |
| .549 | 17.0 | 259.2 | 2.01 | 7 | |
| .552 | 17.2 | 260.0 | 1.90 | 7 | |
| 1892.58 | 4 n | 254.55 | 1.78 | | |
| 1894.77 | 3 | 254.67 | 1.64 | | |

| Date | Sid. T. | p | s | Eyepiece | Remarks |
|------|---------|-----|-----|----------|---------|
| | h | ° | " | | |

 τ Ophiuchi, 8303—Continued

| | | | | | |
|---------|---|--------|------|---------|----------------------|
| 1901.51 | 3 | 254.70 | 1.88 | | |
| 1902.64 | 3 | 255.20 | 1.99 | | |
| 1903.60 | 3 | 255.17 | 1.93 | | |
| 1904.67 | 2 | 254.10 | 1.88 | | |
| 1913.58 | 2 | 260.25 | 2.07 | | |
| 1914.54 | 3 | 258.53 | 2.05 | | |
| 1915.61 | 3 | 259.30 | 2.03 | | |
| 1916.55 | 4 | 258.48 | 2.11 | | |
| 1917.49 | 3 | 258.73 | 2.01 | | |
| 1918.62 | 3 | 260.63 | 1.97 | Maximum | distance about 1915. |
| 1919.55 | 3 | 259.20 | 1.98 | | |

70 Ophiuchi, 8340

18^h 0.4^m

+2° 31'

4.1 6.8

| | | | | | |
|----------|------|-------|------|-----|----------|
| 1907.501 | 17.3 | 165.1 | 2.82 | VI | |
| .524 | 17.2 | 164.2 | 2.87 | VI | |
| .560 | 18.8 | 163.6 | 2.98 | III | |
| .614 | 19.3 | 164.5 | 2.67 | VI | |
| 1908.494 | 16.9 | 161.6 | 3.12 | X | Blurred. |
| .521 | 17.4 | 160.8 | 3.08 | III | |
| .535 | 16.5 | 161.2 | 3.41 | X | |
| .617 | 20.1 | 162.2 | 3.39 | III | |
| 1909.584 | 18.2 | 156.4 | 3.35 | VI | |
| .658 | 18.5 | 157.0 | 3.39 | V | |
| .715 | 20.8 | 152.6 | 3.43 | V | |
| 1910.576 | 18.8 | 151.5 | 3.54 | V | Blasing. |
| .590 | 17.3 | 153.2 | 3.54 | VI | |
| .705 | 19.5 | 155.8 | 3.44 | VII | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece | Remarks |
|------|----------|----------|----------|----------|---------|
| | <i>h</i> | <i>°</i> | <i>'</i> | | |

70 Ophiuchi, 8340—Continued

| | | | | | |
|----------|------|-------|------|-----|--------------|
| 1911.776 | 19.0 | 148.6 | 3.67 | VI | Good. |
| .778 | 19.0 | 149.8 | 3.74 | VII | |
| .792 | 19.4 | 148.0 | 3.71 | VI | Good. |
| 1912.524 | 17.5 | 145.9 | 3.82 | VI | |
| .541 | 17.6 | 146.4 | 3.80 | VI | |
| .565 | 17.6 | 146.8 | 4.03 | V | |
| .614 | 18.2 | 146.4 | 3.91 | VI | |
| 1913.582 | 18.0 | 144.8 | 4.37 | V | |
| .590 | 18.1 | 146.1 | 4.18 | VII | Blurred. |
| .650 | 18.3 | 144.7 | 4.00 | VI | |
| .679 | 20.1 | 142.4 | 4.26 | VII | |
| 1914.474 | 16.4 | 143.2 | 4.11 | 7 | |
| .508 | 17.0 | 143.0 | 4.49 | 12 | |
| .516 | 16.0 | 142.1 | 4.54 | 12 | |
| .543 | 16.7 | 143.1 | 4.52 | 7 | Blazing. |
| 1915.603 | 18.2 | 141.0 | 4.66 | 7 | |
| .606 | 18.8 | 141.0 | 4.73 | 7 | |
| .609 | 18.1 | 140.5 | 4.59 | 9 | |
| .620 | 17.1 | 140.8 | 4.72 | 12 | |
| 1916.466 | 16.3 | 136.0 | 4.84 | 12 | |
| .480 | 15.5 | 138.4 | 5.11 | 9 | |
| .486 | 16.4 | 138.2 | 4.62 | V | |
| .503 | 15.9 | 138.6 | 4.68 | 12 | |
| .679 | 18.9 | 138.4 | 4.98 | 7 | |
| .729 | 20.2 | 136.9 | 4.79 | 7 | Good. |
| .732 | 20.0 | 137.5 | 4.79 | 7 | Bad seeing. |
| 1917.469 | 17.1 | 135.7 | 4.95 | 12 | Good. |
| .491 | 15.7 | 136.9 | 4.91 | 7 | Thro clouds. |
| .513 | 17.7 | 137.1 | 5.14 | 7 | |

| Date | Sid. T. | p | s | Eyepiece | Remarks |
|------|---------|-----|-----|----------|---------|
| | h | ° | ' | | |

70 Ophiuchi, 8340—Continued

| | | | | | |
|----------|------|--------|------|----|------------------|
| 1917.516 | 16.4 | 137.0 | 5.16 | 9 | Good. |
| .685 | 19.2 | 136.0 | 5.01 | 9 | |
| .707 | 20.0 | 137.2 | 5.13 | 9 | |
| .710 | 20.6 | 136.3 | 5.06 | 12 | |
| 1918.524 | 16.7 | 136.5 | 4.92 | 9 | Good. |
| .595 | 17.2 | 137.0 | 5.14 | 7 | |
| .603 | 17.1 | 137.8 | 5.24 | 7 | |
| .628 | 18.0 | 133.6 | 5.33 | 12 | |
| 1919.543 | 17.3 | 133.2 | 5.46 | 12 | Good. |
| .549 | 16.8 | 133.9 | 5.35 | 7 | Good. |
| .557 | 16.8 | 133.3 | 5.19 | 12 | Very bad seeing. |
| .628 | 18.3 | 133.5 | 5.41 | 9 | |
| .723 | 19.6 | 133.0 | 5.45 | 9 | |
| 1888.41 | 3 n | 352.67 | 2.08 | | |
| 1889.51 | 4 | 345.74 | 2.18 | | |
| 1892.57 | 4 | 321.28 | 2.20 | | |
| 1893.62 | 5 | 312.66 | 2.34 | | |
| 1894.75 | 4 | 302.48 | 2.30 | | |
| 1895.60 | 3 | 296.50 | 2.19 | | |
| 1896.63 | 4 | 287.72 | 2.22 | | |
| 1897.65 | 5 | 279.80 | 2.06 | | |
| 1898.60 | 5 | 270.16 | 1.85 | | |
| 1899.58 | 6 | 258.02 | 1.76 | | |
| 1901.63 | 5 | 227.44 | 1.60 | | |
| 1902.63 | 4 | 212.60 | 1.79 | | |
| 1903.55 | 4 | 196.58 | 1.90 | | |
| 1904.69 | 4 | 187.75 | 2.07 | | |
| 1905.74 | 4 | 180.67 | 2.46 | | |
| 1906.55 | 4 | 171.15 | 2.50 | | |

| Date | Sid. T. | p | s | Eye-piece | Remarks |
|------|---------|-----|-----|-----------|---------|
| | h | ° | ' | | |

70 Ophiuchi, 8340—Continued

| | | | | | |
|---------|---|--------|------|--|---|
| 1907.55 | 4 | 164.35 | 2.84 | | |
| 1908.54 | 4 | 161.45 | 3.25 | | |
| 1909.65 | 3 | 155.33 | 3.39 | | |
| 1910.62 | 3 | 153.50 | 3.51 | | |
| 1911.78 | 3 | 148.80 | 3.71 | | |
| 1912.56 | 4 | 146.38 | 3.89 | | |
| 1913.62 | 4 | 144.50 | 4.20 | | |
| 1914.51 | 4 | 142.85 | 4.42 | | |
| 1915.61 | 4 | 140.82 | 4.67 | | |
| 1916.58 | 7 | 137.71 | 4.83 | | |
| 1917.58 | 7 | 136.60 | 5.05 | | |
| 1918.59 | 4 | 136.22 | 5.16 | | Apparently a case of disturbed motion. The areal velocity is not constant. |
| 1919.60 | 5 | 133.38 | 5.37 | | |

O Σ 341, 835318^h 1.6^m

+21° 26'

7.1 8.2

| | | | | | |
|----------|------|-------|------------------|------|-------------------|
| 1907.614 | 19.5 | 85.6 | 0.60 | X | |
| .626 | 18.3 | 88.8 | 0.45 | VII | Separated. |
| 1908.628 | 19.5 | 91.0 | 0.52 | VII | |
| 1909.584 | 18.4 | 92.9 | 0.45 | VIII | Well separated. |
| 1910.718 | 20.3 | 93.6 | 0.58 | VII | |
| 1914.505 | 17.8 | 95.5 | 0.48 | 7 | |
| .549 | 16.1 | 100.2 | 0.43 | 7 | Barely separated. |
| .587 | 17.4 | 97.7 | 0.41 | 7 | Blurred. |
| 1915.603 | 18.4 | 91.0 | 0.37 | 7 | Wedge ? |
| .606 | 19.2 | 94.4 | 0.34 | 7 | Notched. |
| 1916.606 | 17.2 | 112.7 | 0.25 <i>est.</i> | 7 | Elongated? |
| .617 | 17.3 | 98.9 | 0.25 <i>est.</i> | 7 | Wedge ? |
| .628 | 18.7 | 91.4 | 0.30 <i>est.</i> | 7 | Elongated. |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece | Remarks |
|--------------------------------|------------|----------|------------------|-----------|---------------------|
| | <i>h</i> | <i>°</i> | <i>"</i> | | |
| O Σ 341, 9353—Continued | | | | | |
| 1917.516 | 16.0 | ..... | .... |  | Cannot. |
| .565 | 17.7 | 171. | 0.25 <i>est.</i> | 7 | Very doubtful. |
| .617 | 19.0 | 103.2 | 0.35 <i>est.</i> | 7 | Barely separated. |
| .690 | 19.3 | ..... | .... | 7 | Round. Fine seeing. |
| 1918.579 | 18.5 | 313.7 | 0.5 <i>est.</i> | 7 | Separated. |
| .603 | 17.2 | 124.3 | 0.35 <i>est.</i> | 7 | Very doubtful. |
| 1919.584 | 17.6 | ..... | .... | 7 | Cannot. |
| .637 | 19.6 | ..... | .... | 7 | Cannot. |
| 1903.63 | 3 <i>n</i> | 90.60 | 0.42 | | |
| 1906.56 | 3 | 92.63 | .51 | | |
| 1907.62 | 2 | 87.20 | .52 | | |
| 1909.64 | 3 | 92.50 | .52 | | |
| 1914.55 | 3 | 97.80 | .44 | | |
| 1915.60 | 2 | 92.70 | .36 | | |
| 1916.62 | 3 | 101.00 | .27 | | |
| 1917.60 | 2 | 137. | .30 | | |
| 1918.59 | 2 | 129.00 | .42 | | |
| 1919.61 | 2 | ? | ? | | |

99 Herculis, 8372

18^h 3.3^m

+30° 33'

5.7 10.2

| | | | | | |
|----------|------|-------|------|-----|------------------|
| 1907.676 | 18.9 | 337.2 | 1.45 | VI | Blurred |
| 1908.628 | 19.7 | 339.1 | 1.84 | VII | |
| .729 | 20.7 | 330.8 | 1.36 | VII | |
| .751 | 20.0 | 326.0 | 1.21 | VI | |
| 1909.584 | 19.8 | 332.3 | 1.90 | VII | Very bad seeing. |
| 1910.718 | 20.1 | 338.4 | 1.47 | VII | Good. |
| 1911.715 | 22.1 | 338.2 | 1.56 | VI | |
| .721 | 21.4 | 337.7 | 1.59 | VII | |

Ob 9

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece | Remarks |
|-----------------------------|---------|----------|----------|----------|------------------|
| h | ° | ' | | | |
| 99 Herculis, 8372—Continued | | | | | |
| 1912.524 | 17.2 | 343.6 | 1.57 | VI | Difficult. |
| .587 | 17.1 | 342.1 | 1.57 | VI | Blurred. |
| .748 | 20.9 | 336.8 | 1.54 | VI | Good. |
| 1913.679 | 19.7 | 345.7 | 1.63 | VII | |
| 1914.516 | 16.2 | 345.3 | 1.66 | 12 | |
| .519 | 15.4 | 346.6 | 1.74 | 7 | |
| .563 | 17.3 | 345.4 | 1.67 | 12 | |
| 1915.486 | 15.1 | 344.7 | 1.76 | 9 | |
| .606 | 20.3 | 347.6 | 1.89 | V | Difficult. |
| .688 | 19.4 | 343.1 | 1.90 | 12 | Bad seeing. |
| 1916.516 | 17.2 | 351.1 | 1.78 | 12 | Clouds. |
| .521 | 16.5 | 348.2 | 1.92 | 12 | |
| .546 | 16.7 | 347.6 | 1.62 | 12 | |
| 1917.516 | 16.2 | 349.4 | 1.50 | 9 | |
| .568 | 17.0 | 355.9 | 1.62 | V | Very bad. |
| .710 | 20.8 | 349.7 | 1.77 | V | Poor. |
| 1918.524 | 16.0 | 355.5 | 1.76 | 9 | Bad seeing. |
| .699 | 19.3 | 349.8 | 1.55 | 9 | Good. |
| 1919.549 | 17.2 | 354.0 | 1.75 | 7 | Good. |
| .574 | 17.6 | 349.7 | 1.85 | 12 | Very difficult. |
| .732 | 20.4 | 342.8 | 1.64 | 9 | Very bad seeing. |
| 1895.54 | 4 n | 308.62 | 0.97 | | |
| 1896.65 | 3 | 311.93 | 1.07 | | |
| 1897.68 | 3 | 312.60 | 1.04 | | |
| 1900.99 | 4 | 325.18 | 1.39 | | |
| 1902.66 | 3 | 321.23 | 1.55 | | |
| 1903.92 | 4 | 326.93 | 1.41 | | |
| 1906.54 | 3 | 331.70 | 1.49 | | |
| 1908.45 | 4 | 333.28 | 1.46 | | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece | Remarks |
|------|----------|----------|----------|-----------|---------|
| | <i>h</i> | <i>°</i> | <i>"</i> | | |

99 Herculis, 8372—Continued

| | | | | | |
|---------|---|--------|------|--|--|
| 1910.15 | 2 | 335.85 | 1.69 | | |
| 1911.72 | 2 | 337.95 | 1.58 | | |
| 1912.62 | 3 | 340.83 | 1.56 | | |
| 1914.32 | 4 | 345.75 | 1.68 | | |
| 1915.59 | 3 | 345.13 | 1.85 | | |
| 1916.53 | 3 | 348.97 | 1.77 | | |
| 1917.60 | 3 | 351.67 | 1.63 | | |
| 1918.61 | 2 | 352.65 | 1.66 | | |
| 1919.62 | 3 | 348.83 | 1.75 | | |

 Σ 2281, 838018^h 4.6^m

+3° 58'

5.7 7.9

| | | | | | |
|----------|------|-------|------------------|-----|-----------------------------|
| 1909.584 | 18.5 | ..... | .... |  | Cannot. |
| 1910.718 | 20.4 | 90.8 | 0.25 <i>est.</i> | VII | Slight elongation. |
| 1911.776 | 19.3 | ..... | .... |  | Elongated in 90°. |
| 1912.620 | 18.5 | 90. | 0.25 <i>est.</i> | VII | Estimated. Doubtful. |
| 1913.584 | 18.6 | 81.9 | 0.51 | VII | Blurred. Poor. |
| .650 | 18.5 | ..... | .... |  | Elongated in 90°. |
| .679 | 18.7 | 81.2 | 0.40 | VII | Well separated by glimpses. |
| 1914.519 | 18.1 | 81.8 | 0.49 | 7 | |
| .552 | 17.6 | 83.8 | 0.47 | 7 | Very bad seeing. |
| .591 | 17.3 | 84.0 | 0.49 | | |
| 1915.603 | 18.6 | 80.3 | 0.51 | 7 | |
| .606 | 19.5 | 81.2 | 0.51 | 7 | |
| 1916.521 | 17.7 | 68.2 | 0.50 <i>est.</i> | 7 | Very uncertain. |
| .543 | 16.2 | 84.1 | 0.46 | 7 | Blurred. Difficult. |
| .571 | 16.7 | 76.6 | 0.42 | 7 | Good. |
| .729 | 20.4 | 73.6 | 0.42 | 7 | Good. |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece | Remarks |
|------|----------|----------|----------|-----------|---------|
| | <i>h</i> | <i>°</i> | <i>"</i> | | |

 Σ 2281, 8380—Continued

| | | | | | |
|----------|------------|--------|------|---|--|
| 1917.513 | 17.9 | 82.3 | 0.47 | 7 | Difficult. Not separated. |
| .516 | 16.8 | 84.7 | 0.41 | 7 | |
| .589 | 18.0 | 80.1 | 0.47 | 9 | |
| 1918.603 | 17.3 | 75.8 | 0.51 | 7 | |
| .631 | 18.0 | 76.3 | 0.55 | 9 | |
| .682 | 18.2 | 75.9 | 0.40 | 7 | |
| 1919.584 | 17.7 | 73.5 | 0.50 | 7 | |
| .614 | 17.3 | 76.4 | 0.45 | 7 | |
| .631 | 17.4 | 77.3 | 0.42 | 7 | |
| 1894.30 | 2 <i>n</i> | 240.65 | 0.42 | | |
| 1895.77 | 4 | 235.90 | 0.33 | | |
| 1896.63 | 3 | 234.37 | 0.35 | | |
| 1897.68 | 3 | 232.77 | 0.35 | | |
| 1898.60 | 2 | 232.40 | 0.25 | | |
| 1901. | 4 | ? | ? | | |
| 1904. | 3 | ? | ? | | |
| 1911.66 | 2 | 90.40 | 0.25 | | |
| 1914.18 | 5 | 82.54 | 0.47 | | |
| 1915.60 | 2 | 80.75 | 0.51 | | |
| 1916.59 | 4 | 75.62 | 0.43 | | |
| 1917.54 | 3 | 82.37 | 0.45 | | |
| 1918.64 | 3 | 76.00 | 0.49 | | |
| 1919.61 | 3 | 75.73 | 0.46 | | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece | Remarks |
|------|----------|----------|----------|----------|---------|
| | <i>h</i> | <i>°</i> | <i>"</i> | | |

 Σ 2315, 854818^h 21.0^m

+27° 20'

6.2 ...

| | | | | | |
|----------|------------|--------|------------------|---------------------------------|------------------|
| 1908.628 |  | ..... | .... | Suspect elongation in 0°, 0.25" | |
| 1913.679 | 18.8 | 180.7 | 0.35 | VII | Wedge. |
| 1914.491 | 17.3 | ..... | .... | Suspect elongation in 180°. | |
| .549 | 16.3 | 176.2 | 0.34 | 7 | Wedge. |
| .587 | 17.2 | 173.5 | 0.30 <i>est.</i> | 7 | Uncertain wedge. |
| 1915.606 | 19.1 | 177.7 | 0.30 <i>est.</i> | 7 | Wedge. |
| .620 | 17.2 | 178.8 | 0.35 | 7 | Elongated. |
| 1916.571 | 16.8 | 176.1 | 0.25 <i>est.</i> | 7 | Wedge. |
| .574 | 16.5 | 170.1 | 0.25 <i>est.</i> | 7 | Wedge. |
| .606 | 17.3 | 172.7 | 0.35 <i>est.</i> | 7 | Elongated. |
| 1918.603 | 17.5 | 170.9 | 0.30 <i>est.</i> | 7 | Elongated. |
| .682 | 18.7 | 171.6 | 0.35 <i>est.</i> | 7 | Elongated. |
| .699 | 19.8 | 176.0 | 0.35 <i>est.</i> | 7 | Wedge. Good. |
| 1919.637 | 19.7 | 171.1 | 0.30 <i>est.</i> | 7 | Elongated. |
| 1894. | 3 <i>n</i> | ? | ? | | |
| 1896.02 | 4 | 214.95 | 0.25 | | |
| 1897.69 | 3 | 211.00 | .27 | | |
| 1902.34 | 3 | 205.67 | .23 | | |
| 1906.57 | 2 | 195.80 | .22 | | |
| 1908. | 1 | ? | ? | | |
| 1914.27 | 2 | 176.80 | .33 | | |
| 1915.61 | 2 | 178.25 | .32 | | |
| 1916.58 | 3 | 172.97 | .27 | | |
| 1918.91 | 4 | 172.40 | .32 | | |

| Date | Sid. T. | p | s | Eyepiece | Remarks |
|------|---------|-----|-----|----------|---------|
| | h | ° | ' | | |

O Σ 353, ϕ Draconis, 857818^h 22.2^m

+71° 17'

4.2 ...

| | | | | | |
|----------|-----|-------|-------|--|---------|
| 1907.648 | | | | | Single. |
| 1895.39 | 4 n | 44.48 | 0.42 | | |
| 1897.69 | 2 | 44.85 | .51 | | |
| 1904.20 | 2 | 53.15 | .32 | | |
| 1907. | 1 | ? | ? | | |

O Σ 358, 866318^h 31.4^m

+16° 54'

6.3 6.5

| | | | | | |
|----------|------|--------|------|----|-------------|
| 1916.664 | 21.1 | 188.3 | 2.09 | 12 | Bad seeing. |
| .672 | 19.2 | 186.9 | 2.01 | 9 | |
| .679 | 19.0 | 188.1 | 1.92 | 7 | |
| 1917.527 | 16.5 | 187.7 | 1.89 | 12 | |
| .549 | 17.5 | 186.5 | 1.91 | 7 | |
| .568 | 17.2 | 186.1 | 1.98 | 12 | |
| .710 | 21.0 | 187.6 | 1.88 | 12 | |
| 1918.524 | 16.2 | 186.5 | 2.02 | 9 | |
| .628 | 18.3 | 185.1 | 1.74 | 12 | |
| .721 | 19.2 | 186.6 | 1.83 | 9 | |
| 1919.543 | 17.7 | 186.6 | 2.00 | 12 | |
| .574 | 16.7 | 184.4 | 1.84 | 7 | |
| .648 | 18.2 | 186.1 | 1.92 | 7 | |
| 1916.67 | 3 n | 187.77 | 2.01 | | |
| 1917.59 | 4 | 186.98 | 1.92 | | |
| 1918.62 | 3 | 186.07 | 1.86 | | |
| 1919.59 | 3 | 185.70 | 1.92 | | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece | Remarks |
|-----------------------------------|---------|----------|----------|----------|-------------------|
| | h | ° | ' | | |
| Σ 2402, 8844 | | | | | |
| 18 ^h 45.1 ^m | | +10°33' | | | 8.3 8.8 |
| 1907.571 | 18.9 | 205.1 | 0.97 | VI | Blurred. |
| 617 | 17.9 | 204.3 | 0.82 | VI | |
| 1908.628 | 20.2 | 206.1 | 1.06 | VII | |
| .637 | 18.0 | 202.8 | 0.89 | VII | |
| 1909.584 | 18.7 | 25.2 | 0.91 | VI | |
| .789 | 21.5 | 208.5 | 0.96 | VII | |
| 1910.576 | 19.1 | 210.2 | 0.94 | VI | |
| .740 | 21.5 | 207.4 | 1.14 | VII | |
| 1912.541 | 17.8 | 203.4 | 0.83 | VI | |
| .565 | 17.8 | 207.4 | 1.03 | VI | |
| 1913.650 | 18.7 | 206.4 | 0.83 | VI | Good. |
| .679 | 19.0 | 204.6 | 1.01 | VII | |
| 1914.591 | 17.6 | 204.3 | 0.90 | 7 | |
| .595 | 19.3 | 205.6 | 1.06 | 7 | |
| 1916.543 | 17.2 | 208.0 | 1.13 | 7 | |
| .546 | 17.2 | 208.0 | 1.12 | 7 | |
| .571 | 17.0 | 205.4 | 1.07 | 7 | |
| 1917.516 | 17.1 | 208.4 | 1.07 | 7 | |
| .589 | 18.2 | 206.1 | 1.01 | 9 | |
| .617 | 18.0 | 204.8 | 1.08 | 7 | |
| 1918.628 | 18.5 | 205.7 | 0.95 | 9 | Faint, difficult. |
| .699 | 19.1 | 206.4 | 1.03 | 9 | Good. |
| .707 | 19.3 | 206.8 | 0.99 | 7 | |
| 1919.584 | 18.0 | 207.4 | 1.06 | 7 | |
| .614 | 17.5 | 206.1 | 1.05 | 7 | |
| .648 | 18.4 | 203.7 | 1.00 | 7 | |
| 1902.75 | 2 n | 207.50 | 1.10 | | |
| 1907.23 | 3 | 204.27 | 0.94 | | |

| Date | Sid. T. | p | s | Eyepiece | Remarks |
|------|---------|------------|-----|----------|---------|
| | h | $^{\circ}$ | $"$ | | |

 Σ 2402, 8944—Continued

| | | | | | |
|---------|---|--------|------|--|--|
| 1908.63 | 2 | 204.45 | 0.98 | | |
| 1909.69 | 2 | 206.85 | 0.94 | | |
| 1910.66 | 2 | 208.80 | 1.04 | | |
| 1912.55 | 2 | 205.40 | 0.93 | | |
| 1913.66 | 2 | 205.50 | 0.92 | | |
| 1914.59 | 2 | 204.95 | 0.98 | | |
| 1916.55 | 3 | 207.13 | 1.11 | | |
| 1917.57 | 3 | 206.43 | 1.05 | | |
| 1918.68 | 3 | 206.30 | 0.99 | | |
| 1919.61 | 3 | 205.73 | 1.04 | | |

 β 648, 893318^h 53.3^m

+32° 46'

5.2 9.4

| | | | | | |
|----------|------|------|------|----|---------------|
| 1908.549 |  | .... | .... |  | Cannot. |
| .637 |  | .... | .... |  | Cannot. |
| 1912.748 | 21.3 | 76.9 | 0.55 | VI | Separated. |
| 1914.532 | 16.0 | 74.1 | 0.84 | 7 | |
| .549 | 16.5 | 71.2 | 0.84 | 7 | |
| .563 | 17.6 | 72.9 | 0.87 | 7 | |
| 1915.620 | 17.4 | 65.9 | 0.89 | 7 | |
| .713 | 20.0 | 59.0 | 1.21 | 9 | Very blurred. |
| .783 | 22.2 | 63.6 | 0.80 | 9 | |
| 1916.543 | 16.4 | 67.7 | 1.16 | 9 | |
| .571 | 17.3 | 58.9 | 0.92 | 7 | |
| .574 | 16.7 | 60.6 | 0.94 | 7 | |
| 1917.516 | 17.3 | 57.6 | 1.22 | 7 | |
| .568 | 17.8 | 56.4 | 1.04 | 9 | |
| .589 | 17.1 | 60.0 | 0.92 | 9 | |

| Date | Sid. T. | p | s | Eye-piece | Remarks |
|------|---------|------------|-----|-----------|---------|
| | h | $^{\circ}$ | $"$ | | |

 β 648, 8933—Continued

| | | | | | |
|----------|-------|--------|------|----|------------------|
| 1918.524 | 16.4 | 56.9 | 1.02 | 9 | Very bad seeing. |
| .754 | 20.2 | 50.2 | 1.02 | 7 | |
| 1919.543 | 17.5 | 51.4 | 1.31 | 12 | |
| .552 | 16.5 | 54.7 | 1.15 | 7 | |
| .732 | 20.6 | 47.9 | 1.26 | 9 | |
| 1897.66 | 3 n | 234.90 | 1.28 | | |
| 1898.88 | 4 | 228.20 | 1.31 | | |
| 1901.99 | 4 | 218.65 | 1.14 | | |
| 1903.69 | 3 | 213.97 | 1.09 | | |
| 1906.55 | 1 | 189.7 | 0.47 | | |
| 1908. | 2 | ? | ? | | |
| 1912.75 | 1 | 76.9 | 0.55 | | |
| 1914.55 | 3 | 72.73 | 0.85 | | |
| 1915.71 | 3 | 62.83 | 0.97 | | |
| 1916.56 | 3 | 62.40 | 1.01 | | |
| 1917.56 | 3 | 58.00 | 1.06 | | |
| 1918.64 | 2 | 53.55 | 1.02 | | |
| 1919.61 | 3 | 51.33 | 1.24 | | |

 ζ Sagittarii, 896518^h 56.3^m

—30° 2'

2.7 ...

| | | | | | |
|----------|-------|--------|------------------|-----|-----------------------|
| 1909.584 | 18.9 | 262.8 | 0.66 | VII | Separated by glimpses |
| 1914.563 | 18.4 | 231.0 | 0.41 | 7 | Doubtful separation |
| .595 | 19.5 | 220.7 | 0.30 <i>est.</i> | 7 | Elongated. |
| 1915.595 | 19.2 | 204.6 | 0.30 <i>est.</i> | 7 | Uncertain elongation. |
| .606 | 18.9 | 203.4 | 0.35 <i>est.</i> | 7 | Blurred. |
| 1918.699 | 19.6 | ..... | ..... | 7 | Cannot. Good seeing. |
| 1909.58 | 1 n | 262.8 | 0.66 | | |
| 1914.58 | 2 | 225.85 | .36 | | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece | Remarks |
|------|---------|----------|----------|----------|---------|
| | h | ° | " | | |

ζ Sagittarii, 8965—Continued

| | | | | | |
|---------|---|--------|-----|--|--|
| 1915.60 | 2 | 204.00 | .32 | | |
| 1918.70 | 1 | ? | ? | | |

Σ 2434, BC., 8986

18^h 57.6^m

—0° 51'

8.5 10.9

| | | | | | |
|----------|------|------|------|-----|----------------------|
| 1907.614 | 19.7 | 49.8 | 1.22 | V | |
| .626 | 18.7 | 52.1 | 1.29 | VI | |
| 1908.582 | 18.7 | 48.1 | 1.30 | III | |
| .628 | 20.4 | 51.6 | 1.37 | VI | |
| 1909.584 | 19.1 | 48.9 | 1.24 | VI | |
| 1910.743 | 20.9 | 50.1 | 1.27 | V | |
| 1911.778 | 21.3 | 50.1 | 1.12 | VI | Difficult. |
| 1912.620 | 18.8 | 50.0 | 1.19 | VI | Good. |
| 1913.650 | 19.2 | 46.1 | 1.14 | VI | Difficult. |
| .679 | 19.3 | 50.7 | 1.10 | VI | Good. |
| 1914.563 | 17.9 | 47.1 | 1.25 | 9 | Good. |
| .587 | 19.3 | 47.4 | 1.40 | 9 | Faint and difficult. |
| .595 | 19.7 | 47.3 | 1.03 | 12 | |
| .674 | 19.1 | 48.5 | 1.14 | 7 | |
| 1915.603 | 19.1 | 46.4 | 1.13 | 9 | |
| .606 | 19.7 | 48.3 | 1.09 | 9 | |
| 1916.571 | 18.8 | 47.3 | 1.12 | 9 | |
| .574 | 18.3 | 48.2 | 1.07 | 12 | Very difficult. |
| .606 | 17.7 | 46.2 | 1.23 | 12 | Difficult. |
| 1917.617 | 19.2 | 48.8 | 1.04 | 7 | |
| .628 | 17.8 | 46.2 | 1.08 | 7 | Difficult. |
| .690 | 19.6 | 48.6 | 1.07 | 7 | Good. |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece | Remarks |
|------|----------|----------|----------|----------|---------|
| | <i>h</i> | <i>o</i> | <i>"</i> | | |

 Σ 2434, BC., 8996—Continued

| | | | | | |
|----------|------------|-------|------|---|------------|
| 1918.664 | 18.7 | 47.5 | 0.90 | V | Difficult. |
| .699 | 19.6 | 46.7 | 1.01 | V | |
| .707 | 19.4 | 47.2 | 1.00 | V | Good. |
| 1919.584 | 18.6 | 44.3 | 1.05 | 7 | Difficult. |
| .631 | 17.6 | 46.1 | 1.07 | 7 | |
| 1902.70 | 2 <i>n</i> | 52.65 | 1.18 | | |
| 1906.60 | 2 | 52.05 | 1.25 | | |
| 1907.62 | 2 | 50.95 | 1.26 | | |
| 1908.60 | 2 | 49.85 | 1.34 | | |
| 1910.16 | 2 | 49.50 | 1.26 | | |
| 1912.20 | 2 | 50.05 | 1.16 | | |
| 1913.66 | 2 | 48.40 | 1.12 | | |
| 1914.60 | 4 | 47.57 | 1.20 | | |
| 1915.60 | 2 | 47.35 | 1.11 | | |
| 1916.58 | 3 | 47.22 | 1.14 | | |
| 1917.64 | 3 | 47.87 | 1.06 | | |
| 1918.69 | 3 | 47.13 | 0.97 | | |
| 1919.61 | 2 | 45.20 | 1.06 | | |

 Σ 2454, 903819^b 2.3^m

+30° 16'

7.9 9.9

...

| | | | | | |
|----------|------|-------|-----------------|---|----------------------|
| 1916.729 | 20.7 | 255.1 | 0.70 | 7 | |
| .732 | 20.3 | 261.9 | 0.7 <i>est.</i> | 7 | Too bad to measure |
| .776 | 21.3 | 257.7 | 0.70 | 7 | |
| 1917.617 | 18.2 | 253.0 | 0.73 | 7 | Good. |
| .623 | 18.2 | 254.3 | 0.61 | 7 | Very blurred and un- |
| .627 | 18.1 | 255.8 | 0.77 | 7 | certain. Good. |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece | Remarks |
|------|----------|----------|----------|-----------|---------|
| | <i>h</i> | <i>o</i> | <i>r</i> | | |

 Σ 2454, 9038—Continued

| | | | | | |
|----------|------------|--------|------------------|---|--------------------------|
| 1918.603 | 17.8 | 253.1 | 0.79 | 9 | Poor seeing. |
| .721 | 19.7 | 258.3 | 0.88 | 7 | |
| .754 | 20.4 | 257.3 | 0.83 | 7 | |
| 1919.574 | 17.7 | 257.5 | 0.45 <i>est.</i> | 7 | Difficult and uncertain. |
| .584 | 18.2 | 253.3 | 0.77 | 7 | |
| .648 | 18.7 | 249.2 | 1.02 | 9 | |
| 1894.13 | 3 <i>n</i> | 241.53 | 0.69 | | |
| 1916.75 | 3 | 258.23 | 0.70 | | |
| 1917.62 | 3 | 254.37 | .70 | | |
| 1918.69 | 3 | 256.23 | .83 | | |
| 1919.60 | 3 | 253.33 | .75 | | |

 Σ 2455, 904319^h 2.6^m

+22° 0'

7.1 9.5

| | | | | | |
|----------|------------|-------|------|-----|--|
| 1907.676 | 19.2 | 70.9 | 3.52 | III | |
| 1908.535 | 16.7 | 67.7 | 3.71 | X | |
| .549 | 17.0 | 69.6 | 3.76 | X | |
| 1910.743 | 21.9 | 70.4 | 3.83 | V | |
| 1912.565 | 18.2 | 66.4 | 4.08 | VI | |
| 1893.80 | 4 <i>n</i> | 85.58 | 3.36 | | |
| 1894.76 | 2 | 86.70 | 3.36 | | |
| 1897.38 | 3 | 82.33 | 3.57 | | |
| 1898.70 | 3 | 80.83 | 3.34 | | |
| 1899.58 | 3 | 79.00 | 3.54 | | |
| 1901.72 | 2 | 78.70 | 3.51 | | |
| 1906.61 | 3 | 71.73 | 3.76 | | |
| 1908.25 | 3 | 69.40 | 3.66 | | |
| 1911.65 | 2 | 68.40 | 3.96 | | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece | Remarks |
|------|----------|----------|----------|-----------|---------|
| | <i>h</i> | <i>°</i> | <i>'</i> | | |

 Σ 2457, 904519^h 2.8^m

+22° 25'

7.2 9.5

| | | | | | |
|----------|------|-------|-------|----|--|
| 1912.587 | 17.3 | 199.9 | 10.36 | VI | |
|----------|------|-------|-------|----|--|

 Σ 2465, 905519^h 4.2^m

+30° 28'

8.0 10.1

| | | | | | |
|----------|------|--------|------|----|----------------------|
| 1916.664 | 21.3 | 249.8 | 1.21 | 12 | Faint and difficult. |
| .702 | 19.9 | 249.7 | 1.09 | 9 | Blurred. |
| .776 | 21.5 | 248.0 | 1.05 | 7 | Fair. |
| 1917.565 | 18.1 | 250.0 | 1.17 | 7 | |
| 1893.78 | 1 n | 250.2 | 1.04 | | |
| 1916.93 | 4 | 249.38 | 1.13 | | Little change. |

 Σ 2509, 923519^h 15.9^m

+63° 2'

6.8 7.8

| | | | | | |
|----------|------|--------|------|---|------------------|
| 1917.674 | 20.9 | 155.3 | 1.30 | 7 | Very bad seeing. |
| .710 | 20.2 | 334.5 | 1.35 | 7 | Very blurred. |
| .712 | 20.7 | 335.5 | 1.37 | 7 | Very bad seeing. |
| 1918.472 | 15.8 | 335.1 | 1.29 | 7 | Good. |
| .521 | 16.5 | 154.1 | 1.42 | 7 | |
| .603 | 18.5 | 336.4 | 1.37 | 9 | |
| 1919.732 | 21.0 | 332.8 | 1.33 | 9 | |
| 1917.70 | 3 n | 335.10 | 1.34 | | |
| 1918.83 | 4 | 334.60 | 1.35 | | |

OBSERVATIONS OF DOUBLE STARS

| Date | Sid. T. | p | s | Eyepiece | Remarks |
|------|---------|-----|-----|----------|---------|
| | h | ° | ' | | |

 Σ 2525, 931919^h 22.5^m

+27° 7'

7.4 7.8

| | | | | | |
|----------|------|--------|------|-----|---------------------------|
| 1907.626 | 19.1 | 313.1 | 0.81 | VI | Good. Fine definition. |
| .648 | 18.9 | 315.1 | 0.63 | VII | |
| 1910.718 | 20.7 | 308.1 | 0.74 | VII | |
| .740 | 22.1 | 308.8 | 0.68 | VII | |
| 1911.707 | 21.1 | 305.6 | 0.72 | VII | |
| .778 | 21.1 | 306.5 | 0.69 | VII | |
| 1914.491 | 17.4 | 308.7 | 0.72 | 7 | |
| .532 | 16.2 | 309.2 | 0.77 | 7 | |
| .566 | 16.7 | 307.4 | 0.70 | 7 | |
| 1916.524 | 17.0 | 306.7 | 0.70 | 7 | |
| .543 | 16.6 | 307.1 | 0.71 | 9 | |
| .571 | 17.5 | 307.8 | 0.81 | 7 | |
| 1917.565 | 18.8 | 306.8 | 0.80 | 7 | |
| .568 | 18.1 | 305.8 | 0.73 | 9 | |
| .571 | 18.3 | 307.7 | 0.68 | 9 | |
| 1918.603 | 17.9 | 306.5 | 0.90 | 9 | |
| .631 | 18.4 | 306.2 | 0.81 | 7 | |
| .664 | 18.9 | 307.5 | 0.72 | 7 | |
| 1919.574 | 16.9 | 303.9 | 0.70 | 7 | |
| .584 | 18.4 | 308.1 | 0.83 | 7 | |
| .631 | 17.8 | 305.5 | 0.78 | 7 | |
| 1893.80 | 3 n | 329.60 | 0.32 | | |
| 1895.68 | 3 | 327.30 | .39 | | |
| 1896.66 | 3 | 326.40 | .41 | | |
| 1897.64 | 3 | 321.63 | .45 | | |
| 1898.68 | 2 | 320.70 | .47 | | |
| 1901.72 | 3 | 320.33 | .59 | | |
| 1903.43 | 4 | 319.15 | .63 | | |

| Date | Sid. T. | p | s | Eyepiece | Remarks |
|------|---------|-----|-----|----------|---------|
| h | ° | " | | | |

 Σ 2525, 9319—Continued

| | | | | | |
|---------|---|--------|-----|--|--|
| 1906.60 | 3 | 316.17 | .57 | | |
| 1907.64 | 2 | 314.10 | .72 | | |
| 1910.73 | 2 | 308.45 | .71 | | |
| 1911.74 | 2 | 306.05 | .70 | | |
| 1914.53 | 3 | 308.43 | .73 | | |
| 1916.55 | 3 | 307.20 | .74 | | |
| 1917.57 | 3 | 306.77 | .74 | | |
| 1918.63 | 3 | 308.07 | .81 | | |
| 1919.60 | 3 | 305.83 | .80 | | |

Bu. G. C. 9547

19^h 38.9^m

—11° 16'

8.3 9.1

| | | | | | |
|----------|------|--------|------|-----|-------------|
| 1907.614 | 20.1 | 250.1 | 1.23 | V | |
| .626 | 19.2 | 248.0 | 1.24 | VI | |
| 1908.582 | 18.9 | 249.6 | 1.21 | III | |
| .637 | 18.3 | 248.8 | 1.25 | VII | |
| 1909.584 | 19.5 | 247.5 | 1.22 | VI | |
| 1910.743 | 21.1 | 248.9 | 1.26 | VI | |
| .748 | 20.4 | 250.9 | 1.38 | VII | |
| 1914.563 | 18.0 | 249.4 | 1.38 | 9 | Good. |
| .574 | 19.1 | 251.3 | 1.21 | 12 | Bad seeing. |
| .587 | 18.8 | 248.2 | 1.31 | 9 | |
| 1917.659 | 18.9 | 246.9 | 1.31 | 9 | Bad seeing. |
| .707 | 19.6 | 251.1 | 1.37 | 9 | |
| 1902.77 | 3 n | 247.00 | 1.39 | | |
| 1907.62 | 2 | 249.05 | 1.24 | | |
| 1908.61 | 2 | 249.20 | 1.23 | | |
| 1910.36 | 3 | 249.10 | 1.29 | | |

OBSERVATIONS OF DOUBLE STARS

| Date | Sid. T. | p | s | Eyepiece | Remarks |
|------|---------|------------|-----|----------|---------|
| | h | $^{\circ}$ | $'$ | | |

Bu. G. C. 9547—Continued

| | | | | | |
|---------|---|--------|------|--|--|
| 1914.57 | 3 | 249.63 | 1.30 | | |
| 1917.68 | 2 | 249.00 | 1.34 | | |

 β 827, 955119^h 39.2^m

—11° 28'

8.0 10.0

| | | | | | |
|----------|------------|--------|------|-----|--------------------------|
| 1907.614 | 20.2 | 269.3 | 0.70 | V | Wedge. |
| 1908.582 | 19.1 | 266.2 | 0.81 | VII | |
| .637 | 18.5 | 263.1 | 0.63 | VII | Blurred. |
| 1909.584 | 19.3 | 266.4 | 0.86 | VI | |
| 1910.743 | 21.4 | 267.1 | 0.96 | VII | |
| .748 | 20.5 | 267.2 | 0.74 | VII | |
| 1914.563 | 18.1 | 266.5 | 0.94 | 9 | Good. |
| .587 | 19.0 | 265.1 | 0.78 | 9 | |
| 1917.659 | 19.1 | 266.9 | 0.71 | 7 | Difficult and uncertain. |
| .707 | 19.7 | 265.9 | 0.90 | 9 | Bad seeing. |
| 1908.28 | 3 <i>n</i> | 266.20 | 0.71 | | |
| 1910.36 | 3 | 266.90 | .85 | | |
| 1914.57 | 2 | 265.80 | .86 | | |
| 1917.68 | 2 | 266.40 | .81 | | |

 Σ 2574, 957019^h 39.3^m

+62° 26'

.....

| | | | | | |
|----------|------------|--------|------------------|---|------------|
| 1918.521 | 16.7 | 158.8 | 0.30 <i>est.</i> | 7 | Wedge. |
| .603 | 18.3 | 167.2 | 0.30 <i>est.</i> | 9 | Elongated. |
| 1918.56 | 2 <i>n</i> | 163.00 | 0.30 | | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece | Remarks |
|-----------------------------------|----------|----------|----------|----------|------------------|
| | <i>h</i> | <i>°</i> | <i>'</i> | | |
| O Σ 387, 9650 | | | | | |
| 19 ^h 45.0 ^m | | +35° 2' | | | 7.3 8.3 |
| 1907.648 | 19.1 | 330.5 | 0.49 | VII | |
| 1908.642 | 18.6 | 327.2 | 0.75 | VII | |
| .682 | 19.6 | 326.7 | 0.59 | VII | |
| 1909.789 | 21.9 | 320.2 | 0.64 | VII | |
| .899 | 22.2 | 321.1 | 0.55 | VII | |
| 1910.740 | 22.4 | 321.2 | 0.60 | VII | |
| .743 | 21.6 | 322.1 | 0.65 | VII | Difficult. |
| 1911.707 | 21.3 | 322.0 | 0.65 | VII | Good. |
| .721 | 21.7 | 320.5 | 0.67 | VII | |
| 1912.748 | 21.7 | 138.5 | 0.72 | VI | |
| 1914.532 | 16.5 | 319.5 | 0.61 | 7 | |
| .546 | 16.5 | 319.0 | 0.53 | 7 | |
| .566 | 16.9 | 318.5 | 0.50 | 7 | |
| 1915.620 | 17.6 | 313.7 | 0.63 | 7 | |
| .783 | 22.0 | 312.4 | 0.55 | 7 | |
| 1916.524 | 17.2 | 315.7 | 0.48 | 7 | |
| .543 | 17.4 | 312.5 | 0.62 | 7 | |
| .546 | 17.7 | 317.2 | 0.50 | 7 | |
| 1917.519 | 17.4 | 134.5 | 0.56 | 7 | Identification ? |
| .565 | 18.3 | 314.1 | 0.55 | 7 | |
| .568 | 18.3 | 313.7 | 0.54 | 7 | |
| .627 | 18.4 | 313.5 | 0.53 | 7 | Good. |
| 1918.631 | 18.8 | 312.3 | 0.44 | 7 | Bad seeing. |
| .664 | 19.0 | 312.7 | 0.61 | 7 | |
| 1919.549 | 17.6 | 311.8 | 0.51 | 7 | |
| .574 | 17.1 | 307.5 | 0.41 | 7 | Difficult. |
| .631 | 18.1 | 309.0 | 0.54 | 7 | |
| 1892.62 | 4 n | 353.00 | 0.57 | | |
| 1893.80 | 3 | 348.00 | .52 | | |

Ob 10

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece | Remarks |
|------|----------|----------|----------|----------|---------|
| | <i>h</i> | <i>°</i> | <i>'</i> | | |

O Σ 387, 9650—Continued

| | | | | | |
|---------|---|--------|------|--|--|
| 1895.72 | 3 | 346.70 | 0.55 | | |
| 1896.66 | 3 | 343.50 | .59 | | |
| 1897.89 | 4 | 343.95 | .60 | | |
| 1901.74 | 3 | 338.90 | .57 | | |
| 1903.33 | 3 | 336.07 | .65 | | |
| 1904.83 | 3 | 330.17 | .61 | | |
| 1906.60 | 3 | 329.50 | .59 | | |
| 1908.32 | 3 | 328.13 | .61 | | |
| 1909.84 | 2 | 320.65 | .60 | | |
| 1910.74 | 2 | 321.65 | .62 | | |
| 1912.06 | 3 | 320.33 | .67 | | |
| 1914.55 | 3 | 319.00 | .55 | | |
| 1915.70 | 2 | 313.05 | .59 | | |
| 1916.54 | 3 | 315.13 | .53 | | |
| 1917.57 | 4 | 313.95 | .54 | | |
| 1918.65 | 2 | 312.50 | .52 | | |
| 1919.58 | 3 | 309.43 | .49 | | |

O Σ 395, 983319^h 57.8^m

+24° 40'

6.4 6.7

| | | | | | |
|----------|------|-------|------|------|--|
| 1908.637 | 18.8 | 102.1 | 0.65 | VII | |
| .642 | 18.8 | 100.1 | 0.59 | VII | |
| 1909.789 | 22.2 | 103.8 | 0.66 | VIII | |
| .899 | 22.3 | 102.4 | 0.71 | VII | |
| 1910.740 | 22.7 | 104.8 | 0.61 | VII | |
| .748 | 20.2 | 102.0 | 0.67 | VI | |
| 1911.707 | 21.7 | 104.2 | 0.73 | VII | |
| .776 | 22.4 | 104.3 | 0.72 | VI | |

| Date | Sid. T. | p | s | Eye-piece | Remarks |
|------|---------|------------|-----|-----------|---------|
| | h | $^{\circ}$ | $'$ | | |

O Σ 395, 9833—Continued

| | | | | | |
|----------|------|--------|------|-----|------------------|
| 1912.620 | 19.1 | 102.5 | 0.72 | VII | |
| .688 | 19.0 | 106.1 | 0.62 | VII | |
| 1914.549 | 16.7 | 106.8 | 0.77 | 7 | |
| .563 | 16.5 | 107.4 | 0.71 | 7 | |
| .563 | 19.0 | 105.6 | 0.79 | 9 | |
| 1916.524 | 17.6 | 107.1 | 0.64 | 7 | |
| .543 | 17.7 | 103.6 | 0.71 | 7 | |
| .553 | 17.9 | 108.2 | 0.70 | 9 | Very bad seeing. |
| 1917.571 | 17.9 | 109.9 | 0.58 | 7 | Very bad seeing. |
| .589 | 18.8 | 108.0 | 0.72 | 9 | |
| .595 | 18.3 | 109.3 | 0.63 | 7 | Very bad seeing. |
| 1918.603 | 18.7 | 109.7 | 0.76 | 9 | |
| .631 | 18.6 | 108.2 | 0.67 | 7 | |
| 1919.549 | 17.4 | 106.3 | 0.71 | 7 | |
| .574 | 17.3 | 107.3 | 0.59 | 7 | Blurred. |
| .682 | 18.1 | 109.1 | 0.63 | 9 | |
| 1903.33 | 3 n | 99.20 | 0.69 | | |
| 1904.82 | 2 | 101.10 | .72 | | |
| 1906.60 | 3 | 105.37 | .61 | | |
| 1906.64 | 2 | 101.10 | .62 | | |
| 1909.84 | 2 | 103.10 | .68 | | |
| 1910.74 | 2 | 103.40 | .64 | | |
| 1911.74 | 2 | 104.25 | .72 | | |
| 1912.65 | 2 | 104.30 | .67 | | |
| 1914.56 | 3 | 106.60 | .76 | | |
| 1916.54 | 3 | 106.30 | .68 | | |
| 1917.58 | 3 | 109.07 | .64 | | |
| 1918.62 | 2 | 108.95 | .72 | | |
| 1919.60 | 3 | 107.57 | .64 | | |

| Date | Sid. T. | p | s | Eyepiece | Remarks |
|--|---------|----------|------------------|----------|-----------------------|
| | h | ° | ' | | |
| O Σ 400, 9979 | | | | | |
| 20 ^h 6.9 ^m | | +43° 39' | | 7.7 8.4 | |
| 1909.789 | 22.3 | 355.8 | 0.35 <i>est.</i> | VIII | Not separated. |
| .899 | 22.5 | 348.8 | 0.45 | VII | Barely separated. |
| 1910.748 | 22.3 | 346.6 | 0.56 | VII | |
| .805 | 22.4 | 343.8 | 0.45 | VII | Separated by glimpses |
| 1911.776 | 22.6 | 344.5 | 0.53 | VI | Good. |
| .778 | 21.7 | 348.2 | 0.50 | VII | Separated. |
| 1912.748 | 21.9 | 164.1 | 0.44 | VIII | |
| 1914.532 | 16.6 | 345.1 | 0.50 | 7 | Separated |
| .543 | 15.9 | 340.2 | 0.44 | 7 | Blurred. |
| .546 | 17.0 | 338.8 | 0.51 | 7 | |
| 1915.620 | 17.8 | 347.1 | 0.51 | 7 | |
| .783 | 22.4 | 338.5 | 0.53 | 9 | Nicely separated. |
| 1916.524 | 17.2 | 343.9 | 0.48 | 7 | Blurred. |
| .543 | 17.9 | 342.7 | 0.51 | 7 | |
| .571 | 17.7 | 343.9 | 0.48 | 7 | Well separated. |
| 1917.565 | 18.5 | 344.1 | 0.49 | 7 | |
| .571 | 18.1 | 341.0 | 0.47 | 7 | Separated. |
| .627 | 17.8 | 342.2 | 0.47 | 7 | Good. |
| 1919.584 | 18.8 | 341.2 | 0.55 | 7 | |
| .682 | 18.2 | 339.8 | 0.52 | 9 | |
| 1892. | 3 n | ? | ? | | |
| 1895. | 2 | ? | ? | | |
| 1898. | 2 | ? | ? | | |
| 1902.31 | 2 | 23.15 | 0.32 | | |
| 1904.83 | 2 | 1.15 | .37 | | |
| 1906.58 | 3 | 0.63 | .27 | | |
| 1909.84 | 2 | 352.30 | .40 | | |
| 1910.78 | 2 | 345.20 | .50 | | |

| Date | Sid. T. | p | s | Eyepiece | Remarks |
|------|---------|-----|-----|----------|---------|
| | h | ° | ' | | |

 α 400, 9979—Continued

| | | | | | |
|---------|---|--------|------|--|--|
| 1912.10 | 3 | 345.60 | 0.49 | | |
| 1914.54 | 3 | 341.37 | .48 | | |
| 1915.70 | 2 | 342.80 | .52 | | |
| 1916.55 | 3 | 343.50 | .49 | | |
| 1917.59 | 3 | 342.43 | .48 | | |
| 1919.63 | 2 | 340.50 | .53 | | |

 β 670, 1031020^h 28.2^m

+13° 36'

8.6 9.7

| | | | | | |
|----------|------|-------|------|---|-----------|
| 1916.729 | 21.4 | 34.6 | 0.61 | 7 | Very bad. |
| .776 | 21.8 | 36.0 | 0.54 | 7 | |
| 1917.617 | 19.5 | 36.5 | 0.62 | 7 | |
| .627 | 18.7 | 35.6 | 0.60 | 7 | |
| .690 | 19.8 | 37.5 | 0.58 | 7 | |
| 1918.699 | 20.0 | 35.5 | 0.51 | 9 | |
| .707 | 19.7 | 34.9 | 0.38 | 9 | |
| 1919.584 | 19.0 | 37.3 | 0.56 | 7 | |
| .833 | 23.7 | 37.9 | 0.42 | 7 | |
| 1916.75 | 2 n | 35.30 | 0.58 | | |
| 1917.64 | 3 | 36.53 | .60 | | |
| 1918.70 | 2 | 35.20 | .45 | | |
| 1919.71 | 2 | 37.60 | .49 | | |

 β 1136, 1031920^h 28.7^m

+49° 12'

8.0 9.8

| | | | | | |
|----------|------|-----------|-----------|------|------------|
| 1907.648 | 19.3 | 212.5 | 0.44 | VII | Separated. |
| 1909.789 | 22.5 | 190. est. | 0.25 est. | VIII | Elongated. |
| 1910.748 | 22.5 | .... | .... |  | Cannot. |
| 1912.748 | 21.2 | 219.6 | 0.40 | VII | Wedge. |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece | Remarks |
|------|----------|----------|----------|-----------|---------|
| | <i>h</i> | <i>°</i> | <i>"</i> | | |

 β 670, 10310—Continued

| | | | | | |
|----------|------------|-------|------------------|-----|----------------------|
| 1914.546 | 16.7 | 210.2 | 0.30 <i>est.</i> | 7 | Wedge. |
| .549 | 17.0 | 206.9 | 0.42 | 7 | Separated. |
| 1915.783 | 22.5 | ..... | .... | ... | Cannot. |
| 1917.627 | 18.0 | ..... | .... |  | Cannot. Good seeing. |
| 1906. | 1 <i>n</i> | ? | ? | | |
| 1908.72 | 2 | 201.2 | 0.35 | | |
| 1912.75 | 1 | 219.6 | .40 | | |
| 1914.55 | 2 | 208.6 | .36 | | |
| 1916.70 | 2 | ? | ? | | |

 β Delphini, 1036320^h 32.8^m

+14° 15'

3.7

| | | | | | |
|----------|------|-----------------|------------------|-----|-----------------------|
| 1907.648 | 19.5 | 142.3 | 0.25 <i>est.</i> | VII | Elongated. |
| 1909.899 | 22.7 | ..... | 0.25 <i>est.</i> | VII | Elongated in 170°. |
| 1910.740 | 22.8 | 198.1 | 0.25 <i>est.</i> | VII | Oval. |
| .748 | 21.1 | 187.0 | 0.30 <i>est.</i> | VII | Elongated. |
| 1911.707 | 21.5 | 190 <i>est.</i> | 0.25 <i>est.</i> | VII | Elongated. |
| .776 | 22.6 | ..... | ..... |  | Elongated in 225°. |
| 1912.688 |  | ..... | ..... |  | Cannot. |
| 1914.595 | 17.1 | 308.3 | 0.25 <i>est.</i> | 7 | Doubtful elongation. |
| .617 | 19.8 | ..... | .... |  | Cannot. |
| .634 | 19.2 | 297.6 | 0.25 <i>est.</i> | 7 | Elongated. |
| .637 | 18.9 | 298.3 | 0.25 <i>est.</i> | 7 | Very blurred. |
| 1916.574 | 18.4 | 317.1 | 0.30 <i>est.</i> | 7 | Distinctly elongated. |
| .598 | 17.5 | 321.5 | 0.30 <i>est.</i> | 7 | Elongated. |
| .603 | 17.1 | 319.7 | 0.38 | 9 | Elongated. |

| Date | Sid. T. | p | s | Eye-piece | Remarks |
|------|---------|-----|-----|-----------|---------|
| | h | ° | " | | |

 β Delphini, 10363—Continued

| | | | | | |
|----------|------|--------|------------------|---|------------------------|
| 1917.627 | 19.1 | 326.5 | 0.35 <i>est.</i> | 7 | Wedge. |
| .628 | 18.0 | 326.1 | 0.42 | 7 | Not separated. |
| .661 | 18.6 | 329.9 | 0.45 | 7 | Not separated. |
| 1918.682 | 18.7 | 334.7 | 0.41 | 7 | Doubtful separation. |
| .699 | 20.2 | 335.2 | 0.40 | 7 | Separated by glimpses. |
| .734 | 19.2 | 335.2 | 0.46 | 7 | Bad seeing. |
| 1919.584 | 19.2 | 340.5 | 0.39 | 7 | Separated. |
| 1893.79 | 3 n | 346.83 | 0.51 | | |
| 1895.66 | 3 | 350.80 | .58 | | |
| 1896.66 | 3 | 354.03 | .59 | | |
| 1897.67 | 4 | 358.52 | .57 | | |
| 1901.75 | 4 | 11.30 | .50 | | |
| 1903.31 | 3 | 23.33 | .37 | | |
| 1904.81 | 1 | 58.7 | .... |  |  |
| 1907.65 | 1 | 142.3 | .25 | | |
| 1909.90 | 1 | 170. | .25 | | |
| 1911.06 | 3 | 191.70 | .27 | | |
| 1912. | 1 | ? | ? | | |
| 1914.62 | 3 | 301.40 | .25 | | |
| 1916.59 | 3 | 319.43 | .33 | | |
| 1917.64 | 3 | 327.50 | .41 | | |
| 1918.70 | 3 | 335.03 | .42 | | |
| 1919.58 | 1 | 340.5 | .39 | | |

| Date | Sid. T. | p | s | Eyepiece | Remarks |
|-----------------------------------|---------|--------|------------------|----------|----------------------|
| | h | ° | ' | | |
| β 64, 10487 | | | | | |
| 20 ^h 40.2 ^m | | | +12° 21' | | 8. |
| 1916.729 | 21.7 | 198.3 | 0.30 <i>est.</i> | 7 | Elongated. |
| .776 | 22.0 | 198.0 | 0.30 <i>est.</i> | 7 | Elongated. |
| 1917.617 | 19.7 | 188.7 | 0.25 <i>est.</i> | 7 | Elongated. |
| .627 | 18.9 | 197.1 | 0.30 <i>est.</i> | 7 | Wedge. |
| .646 | 18.5 | 190. | 0.30 <i>est.</i> | 7 | Doubtful elongation. |
| .661 | 18.7 | 185.7 | 0.30 <i>est.</i> | 7 | Elongated. |
| 1916.75 | 2 n | 198.15 | 0.30 | | |
| 1917.64 | 4 | 190.37 | .29 | | Slow change. |

| | | | | | |
|--|------|------|---------|------|---------------|
| O Σ 413, λ Cygni, 10533 | | | | | |
| 20 ^h 43.5 ^m | | | +36° 7' | | 4.5 7.8 |
| 1907.626 | 19.5 | 56.8 | 0.82 | VI | |
| 1908.642 | 19.1 | 55.6 | 0.61 | VII | Very blurred. |
| .682 | 19.8 | 61.0 | 0.61 | VII | Blurred. |
| 1909.789 | 22.8 | 58.0 | 0.78 | VIII | |
| .899 | 22.8 | 55.9 | 0.66 | VII | |
| 1910.740 | 23.2 | 55.7 | 0.63 | VII | |
| .748 | 22.6 | 53.5 | 0.71 | VII | |
| 1911.776 | 22.9 | 58.1 | 0.66 | VI | |
| .778 | 22.3 | 58.0 | 0.68 | VII | |
| 1912.688 | 19.3 | 57.8 | 0.64 | VII | |
| .748 | 22.4 | 55.2 | 0.68 | VII | Good. |
| 1914.543 | 16.2 | 57.3 | 0.61 | 7 | Bad seeing. |
| .549 | 17.2 | 54.5 | 0.70 | 7 | |
| .566 | 17.1 | 53.0 | 0.65 | 7 | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece | Remarks |
|--|----------|----------|----------|----------|---------------------|
| | <i>h</i> | <i>°</i> | <i>'</i> | | |
| O Σ 413, λ Cygni, 10533—Continued | | | | | |
| 1916.571 | 17.9 | 56.3 | 0.70 | 7 | Good. |
| .574 | 17.2 | 52.3 | 0.65 | 7 | |
| .598 | 17.7 | 52.8 | 0.55 | 7 | |
| .679 | 19.3 | 59.3 | 0.71 | 7 | Blurred. Difficult. |
| 1917.623 | 17.9 | 55.7 | 0.59 | 7 | Bad seeing. |
| .646 | 18.3 | 59.4 | 0.66 | 7 | Bad seeing. |
| .656 | 18.3 | 57.1 | 0.64 | 7 | Very blurred. |
| .661 | 18.3 | 50.5 | 0.68 | 7 | Blurred. |
| 1919.682 | 18.5 | 53.8 | 0.61 | 9 | |
| .833 | 23.4 | 50.0 | 0.64 | 7 | Blurred. |
| 1892.63 | 3 n | 69.07 | 0.65 | | |
| 1893.80 | 3 | 66.33 | .59 | | |
| 1895.70 | 3 | 74.00 | .57 | | |
| 1896.65 | 3 | 70.07 | .64 | | |
| 1897.79 | 3 | 65.30 | .66 | | |
| 1899.26 | 3 | 72.37 | .63 | | |
| 1901.74 | 2 | 66.20 | .68 | | |
| 1902.74 | 3 | 61.70 | .75 | | |
| 1903.69 | 3 | 66.03 | .79 | | |
| 1904.80 | 3 | 61.00 | .68 | | |
| 1906.60 | 3 | 66.37 | .69 | | |
| 1908.32 | 3 | 57.80 | .68 | | |
| 1909.84 | 2 | 56.95 | .72 | | |
| 1910.74 | 2 | 54.60 | .72 | | |
| 1911.78 | 2 | 58.05 | .67 | | |
| 1912.72 | 2 | 56.50 | .66 | | |
| 1914.55 | 3 | 54.93 | .68 | | |
| 1916.60 | 4 | 55.18 | .65 | | |
| 1917.65 | 4 | 55.68 | .64 | | |
| 1919.76 | 2 | 51.90 | .62 | | |

| Date | Sid. T. | p | s | Eye-piece | Remarks |
|------|---------|-----|-----|-----------|---------|
| | h | ° | " | | |

 Σ 2729, 4 Aquarii, 1055920^h 46.1^m

—6° 0'

6.0 ...

| | | | | | |
|----------|------|--------|------------------|----------------------------|-----------------------|
| 1910.740 | 21.7 | 319.9 | 0.35 <i>est.</i> | VII | Notched |
| .748 | 20.8 | 322.6 | 0.45 | VII | Notched |
| 1911.707 | 21.5 | ..... | .... | Suspect elongation in 340° | |
| .778 | 21.5 | 327.7 | 0.30 <i>est.</i> | VI | Elongated |
| 1912.620 | 19.7 | 330. | 0.30 <i>est.</i> | | Estimated |
| 1914.563 | 18.7 | 334.5 | 0.43 | 7 | Separated by glimpses |
| .595 | 19.9 | 324.7 | 0.48 | 7 | Separated by glimpses |
| .617 | 20.0 | 330.4 | 0.48 | 7 | Very blurred |
| 1915.595 | 20.1 | 341.0 | 0.56 | 7 | Blurred |
| .603 | 20.0 | 332.5 | 0.60 | 7 | Very bad seeing |
| .713 | 20.2 | 326.2 | 0.54 | 7 | Very Blurred |
| .748 | 21.1 | 337.4 | 0.56 | 7 | |
| 1916.571 | 19.1 | 338.6 | 0.55 | 7 | Blurred. |
| .617 | 19.7 | 333.6 | 0.43 | 9 | Not separated. |
| .628 | 19.1 | 339.1 | 0.55 | 7 | |
| 1917.617 | 20.0 | 337.5 | 0.52 | 7 | Not separated. |
| .628 | 19.6 | 336.1 | 0.43 | 7 | Very bad seeing. |
| .674 | 19.0 | 336.7 | 0.35 <i>est.</i> | 7 | Not separated. |
| 1918.699 | 20.6 | 339.0 | 0.51 | 7 | Well separated. |
| .754 | 20.6 | 335.7 | 0.54 | 7 | Barely separated. |
| 1893.31 | 2 n | 178.85 | 0.34 | | |
| 1895.76 | 4 | 193.90 | .26 | | |
| 1897.16 | 2 | 195.22 | .25 | | |
| 1902.24 | 2 | 242.50 | .25 | | |
| 1903. | 1 | ? | ? | | |
| 1910.74 | 2 | 321.25 | .40 | | |
| 1912.20 | 2 | 328.85 | .30 | | |
| 1914.59 | 3 | 329.87 | .46 | | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece | Remarks |
|------|---------|----------|----------|-----------|---------|
| | h | ° | " | | |

 Σ 2729, 4 Aquarii, 10559—Continued

| | | | | | |
|---------|---|--------|------|--|--|
| 1915.66 | 4 | 334.28 | 0.56 | | |
| 1916.60 | 3 | 337.10 | .51 | | |
| 1917.64 | 3 | 336.77 | .43 | | |
| 1918.73 | 2 | 337.35 | .52 | | |

 β 367, 1060720^h 50.7^m

+27° 42'

7

| | | | | | |
|----------|------|-------|--------|---|---------------|
| 1916.776 | 22.0 | 300 : | 0.35 : | 7 | Suspect comes |
|----------|------|-------|--------|---|---------------|

 β 680, 1074721^h 2.5^m

+53° 16'

8.2 9.5

| | | | | | |
|----------|------|--------|------|-----|------------------|
| 1908.642 | 19.3 | 299.1 | 0.55 | VII | Difficult. |
| .682 | 19.1 | 303.1 | 0.52 | VII | Blurred. |
| 1910.748 | 22.9 | 303.5 | 0.52 | VII | |
| 1911.776 | 23.1 | 303.2 | 0.53 | VI | Good. |
| .778 | 22.6 | 301.9 | 0.57 | VII | |
| 1912.658 | 19.6 | 302.6 | 0.58 | VII | |
| 1914.546 | 17.2 | 305.3 | 0.46 | 7 | |
| .549 | 17.5 | 303.8 | 0.62 | 7 | |
| .595 | 17.4 | 304.5 | 0.61 | 7 | |
| 1916.543 | 18.2 | 299.9 | 0.62 | 7 | Difficult. |
| .571 | 18.5 | 303.8 | 0.68 | 7 | Difficult. |
| .574 | 17.5 | 304.7 | 0.60 | 7 | |
| 1906.17 | 4.7 | 304.75 | 0.57 | | |
| 1908.66 | 2 | 301.10 | .54 | | |
| 1911.75 | 4 | 302.80 | .55 | | |
| 1914.56 | 3 | 304.53 | .56 | | Slow retrograde. |
| 1916.56 | 3 | 302.80 | .63 | | motion. |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece | Remarks |
|------|---------|----------|----------|----------|---------|
| | h | ° | " | | |

δ Equulei, 10829

21^h 9.6^m

+9° 36'

4.6 ...

| | | | | | |
|----------|------|-------|------------------|------|-----------------------------|
| 1909.899 | 23.0 | 23.5 | 0.36 | VII | Notched. |
| 1910.702 | 22.2 | 20.6 | 0.30 <i>est.</i> | VIII | Distinct elongation. |
| .740 | 22.9 | 22.9 | 0.25 <i>est.</i> | VII | Elongated. |
| 1912.688 |  | .... | .... |  | Suspect elongation in 300°. |
| 1916.776 | 22.2 | 21.0 | 0.30 <i>est.</i> | 7 | Elongated. |
| 1917.721 | 19.7 | ..... | .... | 7 | Cannot. |
| 1892.78 | 2 n | 21.00 | 0.33 | | |
| 1893.84 | 2 | 19.90 | .22 | | |
| 1895. | 1 | ? | ? | | |
| 1897.32 | 3 | 12.13 | .29 | | |
| 1901. | 1 | ? | ? | | |
| 1903.23 | 2 | 31.00 | .25 | | |
| 1910.45 | 3 | 22.33 | .30 | | |
| 1916.78 | 1 | 21.0 | .30 | | |
| 1917. | 1 | ? | ? | | |

τ Cygni, 10846

21^h 10.8^m

+37° 37'

3.8 8.1

| | | | | | |
|----------|------|-------|-----------------|-----|------------------|
| 1909.899 | 23.3 | 240.6 | 0.78 | VII | |
| 1911.776 | 23.3 | 227.7 | 0.89 | VII | |
| 1912.748 | 22.6 | 221.0 | 1.03 | VII | |
| 1914.549 | 17.7 | 205.9 | 1.17 | 7 | Blazing. |
| .563 | 16.7 | 206.0 | 1.05 | 7 | Poor. |
| .634 | 19.5 | 205.7 | 0.99 | 9 | Bad seeing. |
| 1915.609 | 18.4 | 200.5 | 1.02 | 7 | |
| .620 | 18.3 | 201.9 | 1.0 <i>est.</i> | 7 | Very bad seeing. |
| .783 | 22.7 | 208.8 | 1.01 | 9 | |
| .803 | 0.0 | 206.8 | 1.09 | 9 | Very blurred. |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece | Remarks |
|------|---------|----------|----------|-----------|---------|
| | h | ° | ' | | |

τ Cygni, 10846—Continued

| | | | | | |
|----------|------|--------|------|---|------------------|
| 1916.574 | 17.7 | 200.3 | 1.10 | 7 | |
| .598 | 18.0 | 196.9 | 1.01 | 7 | |
| .603 | 17.3 | 195.4 | 1.08 | 9 | |
| 1917.628 | 18.5 | 192.8 | 1.10 | 7 | |
| .674 | 18.6 | 193.4 | 1.07 | 7 | |
| .690 | 20.1 | 196.2 | 1.23 | 7 | Blurred |
| 1919.682 | 18.8 | 183.4 | 1.15 | 7 | Bad seeing. |
| .833 | 23.9 | 187.9 | 1.36 | 7 | Very bad seeing. |
| 1892.72 | 3 n | 358.43 | 0.60 | | |
| 1895.71 | 2 | 335.10 | .86 | | |
| 1896.67 | 3 | 330.93 | .69 | | |
| 1897.76 | 3 | 323.63 | .88 | | |
| 1902.52 | 4 | 297.50 | .72 | | |
| 1909.90 | 1 | 240.6 | .78 | | |
| 1912.26 | 2 | 224.35 | .96 | | |
| 1914.58 | 3 | 205.87 | 1.08 | | |
| 1915.70 | 4 | 204.50 | 1.04 | | |
| 1916.59 | 3 | 197.53 | 1.06 | | |
| 1917.66 | 3 | 194.13 | 1.13 | | |
| 1919.76 | 2 | 185.65 | 1.25 | | |

Σ 2801, 10994

21^h 21.5^m

+79° 54'

7.4 8.4

| | | | | | |
|----------|------|-------|------|-----|--|
| 1908.642 | 19.6 | 272.2 | 1.65 | V | |
| .682 | 19.3 | 271.5 | 1.75 | VII | |
| 1910.748 | 22.0 | 270.6 | 1.95 | VI | |
| 1911.778 | 22.9 | 271.2 | 1.69 | VI | |

OBSERVATIONS OF DOUBLE STARS

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece | Remarks |
|------|---------|----------|----------|-----------|---------|
| | h | ° | " | | |

 Σ 2801, 10994—Continued

| | | | | | |
|----------|------------|--------|------|-----|--|
| 1912.614 | 19.1 | 272.9 | 1.77 | VI | |
| .620 | 20.1 | 270.6 | 1.73 | VII | |
| 1889.11 | 8 <i>n</i> | 271.55 | 1.68 | | |
| 1893.86 | 3 | 273.20 | 1.61 | | |
| 1895.66 | 4 | 272.15 | 1.85 | | |
| 1901.33 | 4 | 272.60 | 1.78 | | |
| 1908.66 | 2 | 271.85 | 1.70 | | |
| 1911.26 | 2 | 270.90 | 1.82 | | |
| 1912.62 | 2 | 271.75 | 1.75 | | |

 β 1212, 24 Aquarii, 1112521^h 34.3^m

—0°30'

6.8 7.6

| | | | | | |
|----------|------------|--------|------------------|------|------------------------|
| 1907.648 | 20.3 | 281.9 | 0.54 | VII | |
| 1908.642 | 20.2 | 282.5 | 0.57 | VIII | Blurred. |
| .751 | 20.8 | 283.4 | 0.45 | VII | Well separated. |
| 1909.789 | 23.1 | 282.1 | 0.49 | VIII | |
| 1910.702 | 22.4 | 282.1 | 0.49 | VIII | |
| .718 | 22.0 | 282.5 | 0.54 | VII | |
| 1914.617 | 20.2 | 295.9 | 0.45 | 7 | Wedge. Blurred |
| .685 | 20.7 | 293.4 | 0.46 | 7 | Not separated. Bad see |
| 1916.628 | 19.3 | 302.3 | 0.39 | 7 | Elongated. |
| .645 | 19.8 | 297.6 | 0.45 <i>est.</i> | 7 | Elongated. |
| .688 | 20.2 | 305.8 | 0.40 <i>est.</i> | 7 | Not separated. |
| 1917.674 | 19.2 | 311.1 | 0.40 <i>est.</i> | 7 | Not separated. |
| .690 | 20.3 | 302.6 | 0.41 | 7 | Not separated. |
| .712 | 20.0 | 303.9 | 0.40 <i>est.</i> | 7 | Not separated. |
| 1908.35 | 3 <i>n</i> | 102.60 | 0.52 | | |
| 1910.40 | 3 | 102.23 | .51 | | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece | Remarks |
|-------------------------------------|----------|----------|----------|-----------|---------|
| | <i>h</i> | <i>°</i> | <i>"</i> | | |
| β 1212, 24 Aquarii, 11125—Continued | | | | | |
| 1914.65 | 2 | 114.65 | 0.48 | | Binary. |
| 1916.65 | 3 | 121.90 | .41 | | |
| 1917.69 | 3 | 125.87 | .40 | | |

| κ Pegasi, 11222 | | | | | |
|-----------------------------------|------------|----------|------------------|---------------------------|---------------------------|
| 21 ^h 40.1 ^m | | +25° 11' | | 4.3 ... | |
| 1910.702 | 23.2 | .... | .... |  | Cannot see <i>comes</i> . |
| 1911.776 | 23.5 | .... | .... | Suspect elongation in 80° | |
| 1912.688 | .... | .... | .... |  | Cannot. |
| 1917.627 | 19.5 | 115.7 | 0.25 <i>est.</i> | 7 | Slight elongation. |
| .628 | 18.7 | 116.0 | 0.35 <i>est.</i> | 7 | Elongated. |
| .721 | 19.6 | 119.3 | 0.32 | 7 | Notched. |
| 1918.699 | 20.4 | 110.8 | 0.30 <i>est.</i> | 7 | Elongated. |
| 1893.83 | 1 <i>n</i> | 130.5 | 0.25 | | |
| 1895.79 | 4 | 112.70 | .17 | | |
| 1896. | 1 | ? | ? | | |
| 1911. | 3 | ? | ? | | |
| 1917.92 | 4 | 115.45 | 0.30 | | |

| 33 Pegasi, 11690 | | | | | |
|-----------------------------------|------------|----------|------|---------|------------------|
| 22 ^h 18.8 ^m | | +20° 20' | | 6.1 9.3 | |
| 1916.729 | 21.9 | 175.2 | 1.28 | 9 | Bad seeing. |
| .776 | 22.4 | 175.4 | 1.47 | 7 | |
| 1917.617 | 20.2 | 176.9 | 1.18 | 7 | |
| .659 | 19.9 | 177.1 | 1.03 | 7 | |
| .690 | 20.6 | 177.5 | 1.23 | 9 | Blurred. |
| 1918.754 | 20.9 | 178.4 | 1.24 | 7 | Very bad seeing. |
| 1919.833 | 23.2 | 177.6 | 1.46 | 9 | Bad seeing. |
| 1916.75 | 2 <i>n</i> | 175.30 | 1.37 | | |
| 1917.66 | 3 | 177.17 | 1.15 | | |
| 1919.29 | 2 | 178.00 | 1.35 | | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece | Remarks |
|---|---------|----------|----------|----------|------------------------------|
| | h | ° | ' | | |
| <div> <div>22^h 18.9^m</div> <div>β 172, 51 Aquarii, 11691</div> <div>—5° 20'</div> <div>6.8 7.1</div> </div> | | | | | |
| 1907.648 | 20.5 | 358.0 | 0.62 | VII | Blurred. |
| 1908.751 | 20.3 | 355.8 | 0.53 | VII | |
| .756 | 20.5 | 357.8 | 0.66 | VII | |
| 1909.789 | 23.3 | 360.1 | 0.58 | VIII | |
| 1910.702 | 22.6 | 359.7 | 0.71 | VI | |
| .740 | 21.8 | 359.3 | 0.62 | VII | |
| 1911.721 | 22.0 | 358.6 | 0.62 | VII | |
| 1912.620 | 19.9 | 356.8 | 0.61 | VII | |
| .819 | 23.3 | 354.2 | 0.72 | VI | |
| 1914.617 | 20.5 | 355.4 | 0.61 | 7 | |
| .685 | 20.9 | 354.5 | 0.67 | 9 | Very bad seeing. |
| 1915.748 | 21.3 | 356.0 | 0.53 : | 7 | Distance noted as too small. |
| .783 | 23.1 | 357.5 | 0.63 | 9 | |
| 1916.617 | 19.9 | 351.6 | 0.47 | 7 | Blurred. |
| .628 | 19.5 | 355.8 | 0.49 | 7 | Not separated. |
| .688 | 22.2 | 355.6 | 0.71 | 7 | |
| 1917.628 | 19.8 | 352.9 | 0.59 | 7 | Bad seeing. |
| .659 | 19.7 | 351.6 | 0.67 | 7 | |
| .674 | 19.5 | 351.6 | 0.53 | 7 | Blurred. |
| 1893.83 | 3 n | 369.37 | 0.55 | | |
| 1895.79 | 4 | 366.25 | .66 | | |
| 1908.05 | 3 | 357.20 | .60 | | |
| 1910.08 | 3 | 359.70 | .64 | | |
| 1912.39 | 3 | 356.53 | .65 | | |
| 1914.65 | 2 | 354.95 | .64 | | |
| 1915.77 | 2 | 356.75 | .58 | | |
| 1916.64 | 3 | 354.33 | .56 | | |
| 1917.65 | 3 | 352.03 | .60 | | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece | Remarks |
|-----------------------------------|------------|-----------------|------------------|-----------|----------------------|
| | <i>h</i> | <i>o</i> | <i>n</i> | | |
| Σ 2912, 37 Pegasi, 11763 | | | | | |
| 22 ^h 24.9 ^m | | +3° 54' | | 5.5 ... | |
| 1908.751 | 21.2 | 307.3 | 0.30 <i>est.</i> | VII | Elongated. |
| .759 | 20.7 | 308.9 | 0.30 <i>est.</i> | VII | Elongated. |
| 1909.789 | 23.4 | 290 <i>est.</i> | 0.30 <i>est.</i> | VIII | Elongated. |
| 1910.702 | 22.7 | 285.6 | 0.25 <i>est.</i> | VII | Slight elongation. |
| 1911.776 | 22.6 | ..... | .... |  | Cannot. |
| 1917.627 | 19.7 | ..... | .... | 7 | Cannot. |
| .721 | 19.8 | 320.1 | 0.20 <i>est.</i> | 7 | Doubtful elongation. |
| .724 | 19.7 | 317.1 | 0.25 <i>est.</i> | 7 | Blurred. |
| 1908.75 | 2 <i>n</i> | 308.10 | 0.30 | | |
| 1910.25 | 2 | 287.80 | .28 | | |
| 1911. | 1 | ? | ? | | |
| 1917.72 | 2 | 318.55 | .22 | | |

| | | | | | |
|-----------------------------------|------------|----------|------------------|---------|-----------------------|
| Σ 2924, 11828 | | | | | |
| 22 ^h 30.1 ^m | | +69° 22' | | 7.0 7.2 | |
| 1908.751 | 21.5 | 275.3 | 0.56 | VII | |
| .756 | 20.9 | 277.6 | 0.48 | VII | Separated. |
| 1911.778 | 23.1 | 279.0 | 0.64 | VI | |
| 1912.614 | 19.4 | 275.6 | 0.49 | VI | Notched. |
| .620 | 20.4 | 276.5 | 0.51 | VII | Separated. |
| 1914.595 | 17.6 | 279.7 | 0.56 | 7 | |
| .637 | 19.3 | 279.0 | 0.53 | 7 | Separated by glimpses |
| 1916.574 | 17.9 | 281.1 | 0.40 | 7 | Barely separated. |
| .598 | 18.2 | 283.7 | 0.45 | 7 | Barely separated. |
| .603 | 17.6 | 283.8 | 0.46 | 9 | Barely separated. |
| 1918.521 | 16.8 | 290.3 | 0.35 <i>est.</i> | 7 | Barely separated. |
| 1893.86 | 2 <i>n</i> | 269.25 | 0.60 | | |
| 1895.80 | 5 | 270.66 | .70 | | |

Ob 11

OBSERVATIONS OF DOUBLE STARS

| Date | Sid. T. | p | s | Eyepiece | Remarks |
|------|---------|-----|-----|----------|---------|
| | h | ° | ' | | |

 Σ 2924, 11828—Continued

| | | | | | |
|---------|---|--------|------|--|--|
| 1908.75 | 2 | 276.45 | 0.52 | | Apastron about 1850 Star now, 1921, ap- proaching minimum distance. |
| 1912.33 | 3 | 277.03 | .55 | | |
| 1914.61 | 2 | 279.35 | .54 | | |
| 1916.59 | 3 | 282.83 | .44 | | |
| 1918.52 | 1 | 290.3 | .35 | | |

 Σ 2934, 1190822^h 37.1^m

+20° 54'

7.9 8.9

| | | | | | |
|----------|------|--------|------|---|--------------|
| 1916.776 | 23.0 | 124.7 | 0.81 | 7 | Poor seeing. |
| 1917.627 | 19.9 | 123.1 | 0.74 | 7 | |
| .690 | 21.2 | 124.1 | 0.78 | 9 | |
| .712 | 19.7 | 125.9 | 0.76 | 7 | Blurred. |
| 1892.68 | 3 n | 152.00 | 0.90 | | Slow binary. |
| 1893.83 | 3 | 153.60 | .90 | | |
| 1917.45 | 4 | 124.45 | .77 | | |

 β 382, 1203622^h 49.2^m

+44° 13'

6.3 8.6

| | | | | | |
|----------|------|--------|----------|---|-----------------------|
| 1917.627 | 20.1 | 254.2 | 0.52 | 7 | Bad seeing. |
| .690 | 21.3 | 261.0 | 0.5 est. | 7 | Too bad for distance. |
| .710 | 19.6 | 255.4 | 0.58 | 7 | Very bad seeing. |
| .717 | 19.9 | 253.4 | 0.47 | 7 | |
| .721 | 20.1 | 257.4 | 0.52 | 7 | |
| 1917.69 | 5 n | 256.28 | 0.52 | | Well separated. |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece | Remarks |
|------|----------|----------|----------|----------|---------|
| | <i>h</i> | <i>°</i> | <i>'</i> | | |

O Σ 536, 1209022^h 53.5^m

+8° 50'

7. ...

| | | | | | |
|----------|------------|--------|------------------|-----|------------|
| 1908.751 | 20.7 | 158.8 | 0.30 <i>est.</i> | VII | Elongated. |
| .759 | 20.8 | 170.8 | 0.35 <i>est.</i> | | Wedge. |
| 1910.702 | 22.9 | ..... | .... | VII | Round. |
| 1911.776 | 23.7 | ..... | .... |  | Cannot. |
| 1897.78 | 2 <i>n</i> | 166.85 | 0.30 | | |
| 1901.74 | 2 | 162.40 | .30 | | |
| 1904.84 | 1 | 154.6 | .27 | | |
| 1908.76 | 2 | 164.30 | .32 | | |
| 1911. | 2 | ? | ? | | |

O Σ 483, 52 Pegasi, 1209422^h 54.2^m

+11° 12'

5.8 7.8

| | | | | | |
|----------|------------|--------|------|------|------------------|
| 1908.682 | 19.7 | 227.6 | 0.87 | VII | |
| .751 | 20.6 | 224.8 | 0.85 | VII | |
| 1909.789 | 23.5 | 226.1 | 1.04 | VIII | |
| 1910.702 | 23.0 | 225.2 | 0.84 | VII | |
| 1911.776 | 23.9 | 230.3 | 0.91 | VII | |
| 1912.688 | 20.5 | 227.2 | 0.81 | VII | |
| .819 | 23.2 | 231.9 | 0.87 | VI | |
| 1914.712 | 19.9 | 225.7 | 0.82 | 9 | Poor seeing. |
| .794 | 21.2 | 229.0 | 0.84 | 7 | Blurred. |
| 1916.628 | 19.7 | 225.9 | 0.93 | 7 | Very bad seeing. |
| .645 | 20.2 | 227.3 | 0.71 | 7 | Very blurred. |
| .679 | 19.6 | 227.4 | 0.93 | 7 | Very bad seeing. |
| .776 | 23.2 | 229.8 | 1.08 | 7 | |
| 1892.79 | 3 <i>n</i> | 216.53 | 0.80 | | |
| 1893.81 | 3 | 217.13 | 0.97 | | |

| Date | Sid. T. | p | s | Eyepiece | Remarks |
|------|---------|-----|-----|----------|---------|
| | h | ° | " | | |

O Σ 483, 52 Pegasi, 12094—Continued

| | | | | | |
|---------|-----|--------|------|--|--|
| 1895.79 | 4-3 | 218.18 | 1.08 | | |
| 1897.46 | 3 | 221.37 | 1.03 | | |
| 1901.77 | 4 | 220.85 | 0.80 | | |
| 1903.23 | 2 | 220.30 | 0.96 | | |
| 1904.83 | 3 | 222.33 | 1.08 | | |
| 1906.75 | 1 | 223.7 | 0.79 | | |
| 1908.72 | 2 | 226.20 | 0.86 | | |
| 1910.76 | 3 | 227.20 | 0.93 | | |
| 1912.75 | 2 | 229.55 | 0.84 | | |
| 1914.76 | 2 | 227.35 | 0.83 | | |
| 1916.68 | 4 | 227.60 | 0.91 | | |

2 Andromedae, 12125

22^h 58.0^m

+42° 13'

5.1 ...

| | | | | | |
|----------|------|-------|-------|---|----------------------|
| 1917.721 | 20.2 | | | 7 | Cannot. Good seeing. |
|----------|------|-------|-------|---|----------------------|

 π Cephei, 1219623^h 4.7^m

+74° 51'

4.6 8.8

| | | | | | |
|----------|---------|-------|------------------|---------------|------------------------|
| 1910.748 | 21.5 | 58.9 | 0.95 | VII | |
| 1912.620 | 20.5 | .... | .... |  | Cannot. |
| 1915.926 | 2.4 | .... | .... |  | Cannot. |
| 1916.598 | 18.4 | .... | .... | Suspect comes | in 75°, 1" |
| .603 | 17.8 | 74.9 | 0.89 | 9 | Blurred and difficult. |
| 1917.628 | 20.3 | 81.9 | 0.60 <i>est.</i> | 7 | Too bad for distance. |
| .721 | 21.0 | 80.1 | 0.91 | 7 | |
| .874 | 1.9 | 78.5 | 0.77 | 7 | |
| 1889.73 | 6 π | 29.98 | 1.05 | | |
| 189.278 | 2 | 34.35 | 1.00 | | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece | Remarks |
|------|----------|----------|----------|-----------|---------|
| | <i>h</i> | <i>°</i> | <i>"</i> | | |

 π Cephei, 12196—Continued

| | | | | | |
|---------|---|-------|------|--|--|
| 1893.83 | 2 | 36.20 | 0.93 | | |
| 1895.85 | 2 | 38.10 | 1.04 | | |
| 1896.68 | 2 | 43.75 | 1.01 | | |
| 1898.66 | 2 | 42.50 | 0.92 | | |
| 1901.82 | 2 | 47.20 | 0.87 | | |
| 1910.75 | 1 | 58.9 | 0.95 | | |
| 1914. | 2 | ? | ? | | |
| 1917.46 | 4 | 78.85 | 0.79 | | |

 β 79, 1227623^h 12.4^m

—2° 4'

7.1 9.0

| | | | | | |
|----------|------|-------|------|---|------------------|
| 1916.776 | 23.5 | 65.0 | 0.92 | 9 | Bad seeing. |
| .940 | 0.7 | 64.2 | 0.81 | 7 | Diffuse. |
| 1917.721 | 20.3 | 66.7 | 0.96 | 7 | Good. |
| .726 | 20.5 | 63.5 | 0.96 | 7 | Difficult. |
| .745 | 21.6 | 64.3 | 0.97 | 7 | Very bad seeing. |
| 1916.86 | 2 n | 64.60 | 0.86 | | |
| 1917.73 | 3 | 64.83 | .96 | | |

 β 80, 1229023^h 13.8^m

+4° 51'

8.0 9.6

| | | | | | |
|----------|------|-------|------|---------------|---------------------|
| 1908.759 | 20.9 | ..... | .... | Suspect elong | ation in 0°, 0.2". |
| 1914.617 | 20.7 | 218.5 | 0.50 | 7 | Very blurred. |
| 1915.748 | 21.6 | 235.9 | 0.57 | 7 | |
| .783 | 23.3 | 236.8 | 0.45 | 9 | Well separated. |
| .806 | 21.9 | 234.8 | 0.59 | 7 | Too bad to measure. |
| .825 | 22.6 | 234.4 | 0.43 | 7 | Very blurred. |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eyepiece | Remarks |
|------|---------|----------|----------|----------|---------|
| | h | ° | " | | |

β 80, 12290—Continued

| | | | | | |
|----------|------|--------|------|---|-------------|
| 1917.721 | 20.6 | 239.4 | 0.63 | 7 | Good. |
| .726 | 20.7 | 240.7 | 0.64 | 7 | Bad seeing. |
| .874 | 1.6 | 244.2 | 0.61 | 9 | |
| 1897.83 | 1 n | 341.4 | 0.53 | | |
| 1901.72 | 1 | 5.9 | .25 | | |
| 1908. | 1 | ? | ? | | |
| 1914.62 | 1 | 218.5 | .50 | | |
| 1915.79 | 4 | 235.48 | .51 | | |
| 1917.77 | 3 | 241.43 | .63 | | |

O Σ 507, 12573

23^h 43.8^m

+64° 19'

7.1 8.2

| | | | | | |
|----------|------|--------|------|------|---------------|
| 1908.751 | 21.9 | 266.2 | 0.67 | VIII | |
| .756 | 21.1 | 262.8 | 0.47 | VII | |
| 1912.614 | 19.7 | 269.1 | 0.55 | VII | |
| .620 | 20.8 | 269.2 | 0.52 | VII | Separated. |
| 1914.546 | 17.4 | 277.3 | 0.61 | 7 | |
| .549 | 17.9 | 276.2 | 0.60 | 7 | Very blurred. |
| 1916.658 | 18.9 | 272.6 | 0.52 | 7 | Very blurred. |
| 1917.717 | 19.5 | 275.2 | 0.58 | 7 | |
| .721 | 20.8 | 274.7 | 0.64 | 7 | Good. |
| .726 | 19.5 | 275.9 | 0.68 | 7 | Blurred. |
| .729 | 19.8 | 271.8 | 0.54 | 7 | Very bad. |
| 1901.85 | 2 n | 264.55 | 0.66 | | |
| 1906.65 | 1 | 271.2 | .47 | | |
| 1908.75 | 2 | 264.50 | .57 | | |
| 1912.62 | 2 | 269.15 | .54 | | |
| 1914.55 | 2 | 276.75 | .60 | | |
| 1917.51 | 5 | 274.04 | .61 | | |

| Date | Sid. T. | <i>p</i> | <i>s</i> | Eye-piece | Remarks |
|-----------------------------------|------------|----------|----------|-----------|--------------|
| | h | ° | ' | | |
| Σ 3050, 12675 | | | | | |
| 23 ^h 54.4 ^m | | +33° 10' | | 6.2 | 6.6 |
| 1915.926 | 2.2 | 223.0 | 2.13 | 12 | Thro clouds. |
| .951 | 1.0 | 220.9 | 2.03 | 12 | |
| 1916.679 | 19.7 | 221.5 | 2.07 | 7 | |
| .688 | 22.4 | 221.6 | 2.12 | 7 | |
| .729 | 22.2 | 223.6 | 2.20 | 9 | |
| .940 | 1.0 | 222.1 | 2.12 | 7 | |
| 1917.012 | 3.1 | 223.7 | 2.08 | 9 | |
| .628 | 20.1 | 222.9 | 1.95 | 7 | |
| .659 | 18.7 | 221.4 | 2.01 | 9 | |
| .661 | 19.9 | 223.3 | 1.89 | 12 | |
| .740 | 20.0 | 221.5 | 2.05 | 7 | Bad seeing. |
| 1894.30 | 4 <i>n</i> | 210.52 | 2.66 | | |
| 1915.94 | 2 | 221.95 | 2.08 | | |
| 1916.81 | 5 | 222.50 | 2.12 | | |
| 1917.67 | 4 | 222.28 | 2.22 | | |

Hn. 60, 12696

| | | | | | |
|-----------------------------------|------------|---------|------------------|----|------------------------|
| 23 ^h 56.3 ^m | | +39° 4' | | 8. | ... |
| 1917.721 | 21.2 | 274.7 | 0.32 | 7 | Separated by glimpses. |
| .726 | 20.2 | 278.2 | 0.35 <i>est.</i> | 7 | Very difficult. |
| 1888.17 | 2 <i>n</i> | 104.95 | 0.54 | | |
| 1893.14 | 3 | 91.07 | .25 | | |
| 1917.72 | 2 | 276.45 | .34 | | |

85 Pegasi, 12701

| | | | | | |
|-----------------------------------|------|----------|-------|-----|---------|
| 23 ^h 56.8 ^m | | +26° 34' | | 5.8 | ... |
| 1915.783 | 23.5 | ..... | ..... |  | Cannot. |

Examined frequently from 1895 to 1915, but comes never seen.

The End.



3 2044 029 750 262

